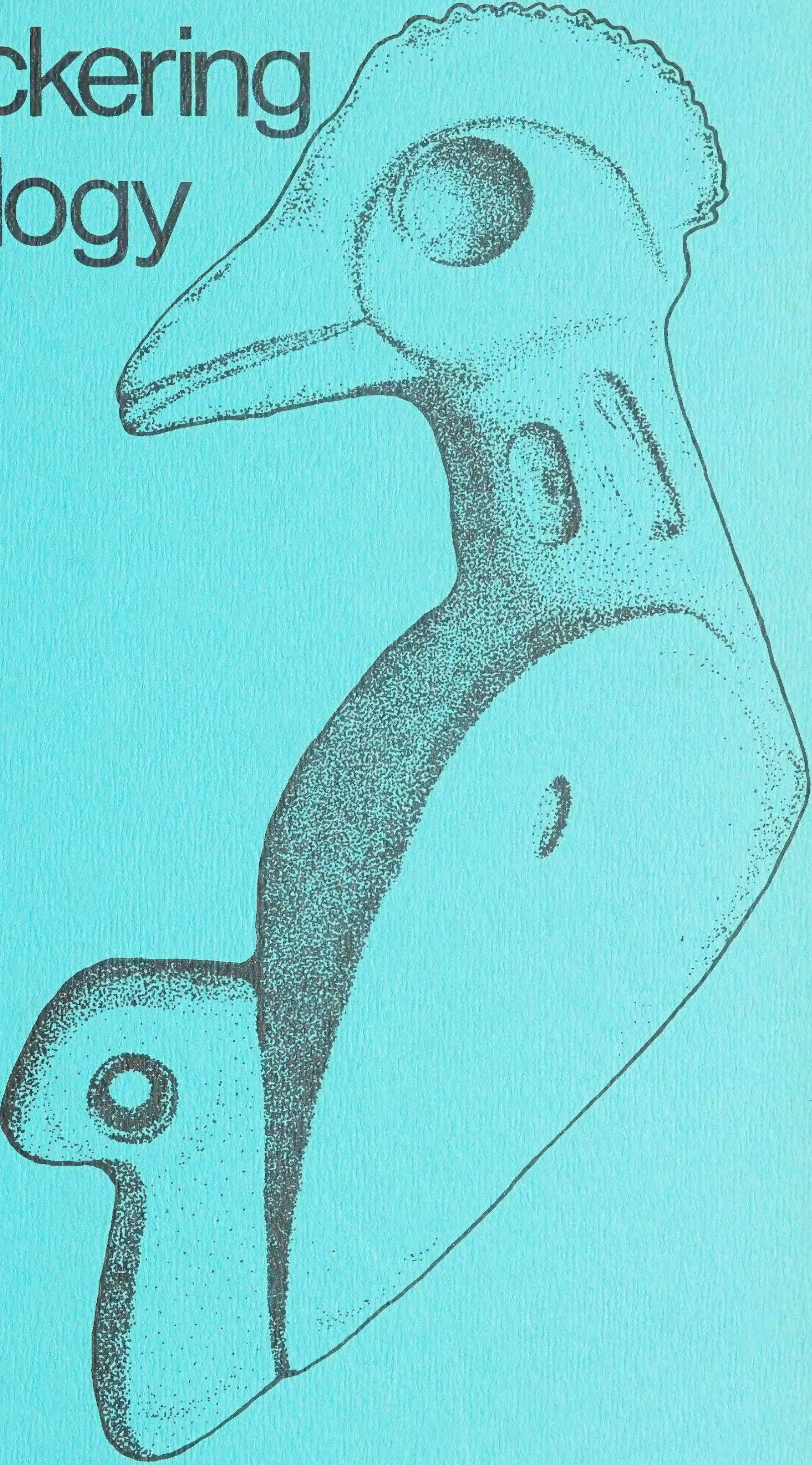
North Pickering Archaeology



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Irene Bowman

RESEARCH REPORT 4

June 74

COVER

The bird, judging by the angle of its perch, its crest and its prominent beak, possibly represents a pileated woodpecker. This woodpecker appears to have had various uses. The thong hole at its feet suggests that it may have been worn, perhaps around the neck of its owner as an amulet or for personal adornment. It also functions as a pipe. The bowl is located at the shoulders and the stem hole in the middle of the back. A reed may have been employed as a stem.

As the pipe was not found with any evidence of prehistoric occupation, nor in association with any other artifacts, its origins must therefore remain an enigma. However, the pipe was found near the location of both a Late Ontario Iroquois and a Laurentian Archaic site. The possibility that this carved bird was found by an Iroquoian artisan, over a thousand years after its original manufacture, and transformed into a pipe, should not be dismissed.

Whatever its source this specimen of proficient craftsmanship, found during the nineteenth century by Sim Reesor's father, has survived to attest to the wealth of prehistory contained in the area of the North Pickering Project.

EDITOR Peggie Nunn

DESIGN Peggie Nunn

PART I

An Archaeological Survey for the North Pickering Project

Victor A. Konrad
William A. Ross

Preface

Planning for the development of a community poses numerous problems. Significant among these is the problem of preserving the cultural heritage of the past. The imprint of man's prehistoric and historic occupation of the North Pickering Project is very much in evidence in the landscape of the present. The past has in fact played a major role in developing this landscape. The development of a large community can easily eradicate a great deal of the past. Due to the unique opportunity of planning for the development beforehand, however, it can insure the preservation of the past for future generations. It can also, again due to the advantages of advance planning, ensure that the past is adequately and accurately represented.

The archaeological site inventory of the North Pickering Project, Konrad and Ross 1973, was but one of several resource inventories carried out in the project area. This particular inventory was designed to locate archaeological sites of the area, to determine their cultural affiliations, to assess their condition and to make specific recommendations regarding the preservation of prehistoric resources in the North Pickering Site area.

The white pine succession study resulted from work carried out in Pickering on the nearby Airport Site area, by the Ontario Archaeology Society in the summer of 1973. This study was greeted with enthusiasm by scholars. It has provided new data whose results unexpectedly provide ecological correlation with the Konrad and Ross survey. Thus the two were combined in a single, complementary report.

The Bowman paper is being published with the kind permission of the author; the Ontario Archaeological Society, Brian Hayden - Director of the O.A.S. excavation; and the National Museums of Man who administered the funding for the project.

R.G. Bowes
Director
Historical Sites Branch

Acknowledgements

This archaeological survey was supported by the North Pickering Project of the Ministry of Treasury, Economics and Intergovernmental Affairs, Ontario. We would like to thank Bill Wilson (Environmental Co-ordinator) and Dave Menzies (Property Manager) of the project for their advice and logistical support. We would also like to thank Michelle Greenwald for her interest in the prehistory of the area. It initiated our involvement in the North Pickering Project.

Special thanks go to the field crew: Leigh Hambly, Arthur Roberts and Elizabeth Salter. Their experience, diligence and enthusiasm were necessary for the completion of the survey.

The residents of the project area were extremely receptive to our survey. Almost without exception, they provided us with valuable information, permission to survey their property and an enthusiastic and fulfilling interest in our work. We would particularly like to extend thanks to Sim Reesor, Russell Reesor, Fred Ansell, Jim Reading and Brenda Davies.

Professional advice was rendered by Dr. J. Norman Emerson, Professor of Anthropology at the University of Toronto; Bill Russell, Historical Sites Branch Archaeologist; and C. S. Reid of the Department of Anthropology at McMaster University. For this we are grateful.

Guidance in the designation of Borden numbers was provided by Louise Estabrooks, Archaeological Survey of Canada Archivist with the National Museum of Canada.

Victor A. Konrad
William A. Ross

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Introduction

For over a century, archaeological surveys in Ontario have been conducted by a few dedicated archaeologists. Of those involved some have been interested only in recording sites of specific cultural affiliations. A.F. Hunter and Frank Ridley, for example, have both committed many years to the search for Late Ontario Iroquois sites in northern Simcoe County. Many of J.V. Wright's surveys, on the other hand, have been aimed at developing the cultural chronology for Ontario.[1] Whatever the immediate purpose of these and other past surveys in Ontario, the final objective has always been an increment to knowledge of the province's prehistory.

Although this must remain our ultimate goal, we can no longer afford the luxury of carrying out archaeological surveys as the precursor of archaeological research alone. Wright (1969:12-14) points out that our archaeological resources are being destroyed at an accelerating rate, and it is difficult to estimate how many thousands of sites have been eradicated to date. A greater number will certainly be destroyed by the development of more highways, dams, airports and urban places. The destruction of most of the archaeological sites in Metropolitan Toronto has already occurred (Konrad, 1973:130). Archaeological surveys must now be carried out in response to development pressures as well as demands of archaeological research. Systematic survey techniques must be employed in order to ensure that they are performed rapidly and thoroughly. If such surveys are not undertaken, sites of potential importance to further research may be destroyed.

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1) For references to the numerous surveys carried out by these and other archaeologists in Ontario, the interested reader is directed to W. Noble (1972).

Wright (1969:12-14) urges that archaeological sites be viewed as resources, and non-renewable resources at that. Once destroyed they cannot be replenished. As a resource, archaeology becomes the property of the people as well as the people's responsibility. As a public resource, archaeology should be at the public's disposal (McGimsey, 1972:6). Before this potential resource can be wisely utilized, however, it must be understood. This will require public education through both formal and informal channels. Informal education of the public could be achieved through the reconstruction and interpretation of Ontario prehistory in public parks, conservation areas and museums. The Historical Sites Branch is presently initiating programmes of informal education in Ontario's prehistory and history in the context of our Provincial Parks (MacLeod, 1973).

In the North Pickering Project, our objectives included not only a systematic inventory of the archaeological resources, a preliminary interpretation of the area's prehistory, and recommendations for the preservation and salvage of potentially important sites, but also a preliminary proposal for the utilization of these resources in the context of a new development.

The study area, delineated in Figure 3, was subjected to an intensive and uniform survey for archaeological sites. The entire area was initially subdivided into sections whose size and number were regulated by the number of days available for survey and testing in the area (Figure 1). These areas were systematically covered on a day to day basis. An attempt was made to interview all residents in order to tap the local knowledge of the area.

It became obvious, during the implementation of our projected survey schedule, that a rigorous adherence to the block by block survey did not allow us to follow up leads on sites outside of our scheduled survey blocks. Consequently, for the balance of the season, information that came to our attention was

Figure 1. Testing for evidence of indigenous occupation.

Figure 2. A test square, New Site (AlGt-36).

immediately investigated. This tactic aided in maintaining good relations with the area residents, on whose co-operation we depended, and also insured the investigation of all possible sources of information. The basic survey pattern was maintained as a guide to our activities.

Our excavations were kept to a minimum for two basic reasons. Excavation is a time consuming process and our major aim was to gain the best possible assessment of the number, location and condition of the sites in the area. The large area to be covered, therefore, demanded that we restrict ourselves to surveying for all possible traces of prehistoric occupation. Second, we discovered that the artifact collections of local residents, our own surface collections and minimal test excavations (Figure 2) provided sufficient evidence to place the sites within a broad period context. All known collections of local residents were photographed.[2]

Several sites outside the boundaries of the proposed townsite were also checked. It was felt that a more complete picture of the aboriginal habitation would be obtained by investigating some of the sites adjacent to our survey area. These sites have been separated in the analysis.

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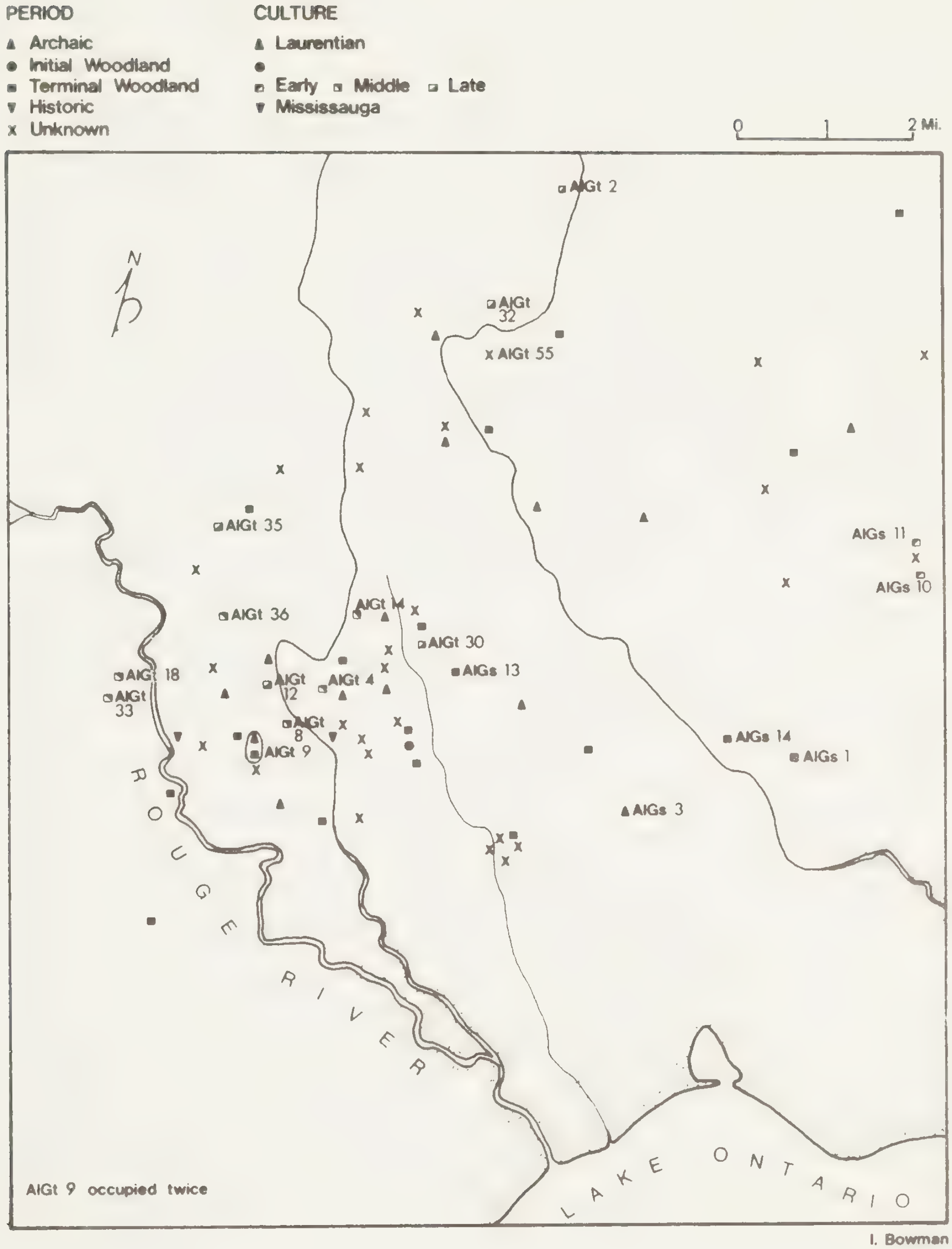
2) These records and the artifacts obtained from our surface collections and test excavations have been deposited with the Historical Sites Branch.

Figure 3.



The Cultural Affiliation of Archaeological Sites in the North Pickering Project Area

The Archaeological Sites of the North Pickering Project

The archaeological survey of the North Pickering Project area has produced an inventory of fifty-nine archaeological sites. An additional seventeen sites, located adjacent to the project area, were also recorded.[1] A standard recording procedure was adopted for every site in order to insure the acquisition of comparative data that would be useful not only for the evaluation of the cultural affiliation and the physical characteristics of the sites, but also for the determination of priorities for the preservation of archaeological sites. Accumulated data on the type, cultural affiliation, physical characteristics and condition of the sites appear in Appendix II.

This section of the report deals with the location, type, cultural affiliation and physical characteristics of the archaeological sites discovered. The data have been synthesized to provide a preliminary interpretation of the prehistory of the area. This prehistorical sketch is based on the 1973 research, and previous work carried on by Donaldson (1960, 1961, 1962a, 1962b and 1965), Emerson (1954, 1956 and 1968), Garrad (1971), Kenyon (1959, 1960, 1967, and 1968), Konrad (1971 and 1973), Reid (1973), Ridley (1958), Webb (1969) and Wright (1960 and 1962). Wright's *Ontario Prehistory* and *Ontario Iroquois Tradition* provide the framework for this preliminary interpretation. A considerable amount of archaeological excavation will be required to provide a satisfactory prehistory for the area.

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1) These sites, although located outside the North Pickering Project boundaries, are related in a cultural, temporal and spatial context to the sites inside the survey area and are consequently essential to our evaluation of the archaeological resources of the survey area.

1. The Location of Sites

The importance of accurate locational information for prehistoric sites cannot be overemphasized. Prehistoric sites, situated in a landscape that has sustained hundreds or thousands of years of natural and man made changes since the time of occupation are discernible to the trained specialist only. In order to insure the subsequent location of these sites, a record of accurate and adequate locational information is mandatory. Although such data have been collected and recorded for every site in the survey area, they are not provided in this published report in order to insure the preservation of archaeological resources. A generalized distribution map provides adequate locational information to complement this discussion.

An examination of site distribution (Figure 3) reveals a relatively dense concentration of finds in the southwestern quarter of the North Pickering Site. In fact the majority of archaeological sites are located in this area. So dense is the concentration of finds, that most are within a half a mile of their nearest neighbour. The distance between neighbouring sites is substantially increased in other parts of the survey area, but minor concentrations do occur.

Outside of providing an indication of the general distribution of finds, the cartographic documentation of site locations must be related to cultural and environmental variables before it can provide insights useful for the interpretation of prehistory.

2. The Cultural Affiliation of Sites

Three lines of evidence were useful in determining the cultural affiliation of archaeological sites in the survey area. These were as follows: an evaluation of the size of the site, a determination of the type of site, and most important, the retrieval of an artifact sample from the site. The first two lines of evidence provide a useful check on the results of artifact analysis but cannot give diagnostic proof of a site's cultural affiliations. Due to the preliminary nature of the testing operations carried out, cultural affiliations are expressed in the generalized archaeological period context outlined by Wright (1972:8) and represented in Figure 4.

The prehistoric periods represented in the survey area are the Archaic, the Initial Woodland and the Terminal Woodland. A few sites are related to the period of occupation by Historic indigenous peoples. No evidence attributable to the Palaeo-Indian period was uncovered. This fact is not surprising since most of the evidence of Palaeo-Indian occupation in Southern Ontario has resulted from chance finds which occur largely in Southwestern Ontario. The evidence of Initial Woodland occupation is tenuous - only one projectile point diagnostic of this period was located. The lack of diagnostic evidence for the Initial Woodland period supports the findings, or lack of findings, of recent archaeological surveys in the Toronto area. Only a handful of sites, out of a total that now exceeds 200 for the Metropolitan Toronto Planning Area, indicate any evidence of Initial Woodland occupation (Konrad, 1973:50). While the evidence for the Initial Woodland and the Palaeo-Indian periods is extremely sparse to non-existent, both the Archaic and the Terminal Woodland are well represented.

A breakdown of the site inventory by cultural affiliation appears as Table 1. Although a substantial number of the sites

Table 1.

THE CULTURAL AFFILIATION OF SITES

CULTURAL AFFILIATION	WITHIN NORTH PICKERING	TOTAL SITES RECORDED
Unknown	23	30
Archaic	12	15
Initial Woodland	1	1
Terminal Woodland	22	28
Historic	2	3
	60*	77*

*An Archaic and a Terminal Woodland component have been reported for the Sewell Site. This increases the totals by one component.

Figure 4.

A GENERALIZED PREHISTORICAL CHRONOLOGY FOR THE NORTH PICKERING PROJECT

YEARS A.D.	 B.P.	PERIOD	SOUTHERN ONTARIO CHRONOLOGY	NORTH PICKERING CHRONOLOGY
		HISTORIC	ALGONKIAN CULTURE	HISTORIC MISSISSAUGA
1650	350			
1450	550			Late Ontario Iroquois Huron-Petun Branch Southern Division
1350	650	TERMINAL WOODLAND	Ontario Iroquois and St. Lawrence Iroquois cultures	Middle Ontario Iroquois Middleport Sub-stage
1250	750			Early Ontario Iroquois Pickering Branch
1000	1000			
			Princess Point Culture	
0	2000	INITIAL WOODLAND	Saugeen-Point Peninsula-Meadowood Cultures	Point Peninsula Culture?
	3000			
	4000	ARCHAIC	Laurentian Culture	Laurentian Culture
	5000			
	6000			
	7000			
	8000		Plano Culture	
	9000	PALAEO INDIAN		
	10000		Clovis Culture	
	11000			

(After Wright, 1966, 1972).

defy cultural identification, due to either their poor condition or their isolated find character, the majority of sites located can be associated with at least a general archaeological period. The sparse evidence of Initial Woodland occupation has already been discussed. Historic representations, inside the North Pickering Site area, are former Mississauga encampments of relatively recent origin. They were occupied well after European settlement in the area had been initiated. A possible Historic Iroquois burial site (AkGs-5) was located adjacent to the project area. This site requires further and immediate investigation.

Archaic and Terminal Woodland sites comprise the larger part of the inventory. A total of twelve Archaic sites are located within the survey area and an additional three were found immediately adjacent. The location of both Archaic and Terminal Woodland sites on the borders of the North Pickering Site dispels any notion that the site concentrations of these two periods were confined within the survey area and also provides some evidence of the nature of the extension of these concentrations outside the survey area. This evidence reinforces the findings of past surveys in the area east of Toronto (Konrad, 1973:47).

Although the evidence of Archaic occupation is sufficient only to assign these sites to the broad context of Laurentian culture[2], a number of Terminal Woodland sites can be assigned to a stage and even a substage affiliation (Wright, 1966). These sites are understandably those that have seen some excavation and analysis by archaeologists.

Included here is the well-known and well-documented Miller Site (AlGs-1) excavated by Dr. Walter Kenyon of the Royal Ontario Museum (Kenyon, 1959, 1960, 1967, 1968). This is an Early Ontario Iroquois village site of the Pickering Branch (or

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2) This is also attributable to the preliminary state of Archaic period research in Southern Ontario.

substage) located in the southeastern portion of the townsite. Although the only other site within the survey area exhibiting any evidence of Early Ontario Iroquois occupation is the now eradicated Deckers Hill Site (AlGs-14), two sites associated with this stage are known adjacent to the southeastern boundary of the North Pickering Site (see Figure 3). These are the Boys (AlGs-10) and Carleton (AlGs-11) Sites tested by Clarke and Ridley in 1955 (Ridley, 1958). Both sites are now being excavated and analyzed by C.S. Reid of McMaster University (Reid, 1973). Although the Boys Site is clearly an Early Ontario Iroquois site, the Carleton Site has also produced evidence of Late Ontario Iroquois occupation and thus requires further investigation.

The largest proportion of Terminal Woodland sites appears to be associated with the Middle Ontario Iroquois stage. An analysis of the Millroy Site (AlGt-4) material places it within the Middleport or final substage of the Middle Ontario Iroquois (Wright, 1966:59-64). Although a substage affiliation has not been determined for AlGt-8, AlGt-14 and AlGt-36, all of these are Middle Ontario Iroquois sites. Upon completion of further research on the other known village sites in the southwestern portion of the survey area, a greater number of Middle Ontario Iroquois sites will likely emerge. The relatively dense concentration of Middle Ontario Iroquois sites in the Rouge River valley is reinforced by the location of an additional number of sites west of the townsite boundary. These include the Robb Site (AlGt-33, Wright, 1966:60), the Elliot Site (AkGt-2, Donaldson, 1965) and the Faraday Site (AlGt-18, Konrad, 1973).

Also included in the dense concentration of Terminal Woodland sites in the southwestern townsite area are a number of Late Ontario Iroquois components: the Sim Reesor Site (AlGt-12), the Fred Beare Site (AlGt-30) and the Burkholder Site II (AlGt-35). Substage affiliations for these sites await further research. They are, however, definitely not Historic Ontario Iroquois and appear to be related to the Southern or earlier

division of the Huron-Petun Branch as outlined by Wright (1966). This is reinforced by their geographic location. An hypothesis of transitional, substage affiliation, between the Middle and Late Ontario Iroquois, warrants investigation. Should this prove to be the case, the concentration of sites would prove extremely valuable to Iroquoian research.

Both site size and type data are of value in reinforcing preliminary cultural affiliation designations based upon the artifact samples retrieved from site testing. The relationships existing between the cultural affiliations of sites and both site size and type have been previously tested for a large sample of sites in the Metropolitan Toronto area (Konrad, 1973:58-63). The results indicate a modal[3] site size of 1.1-3.0 acres (.425-1.234 hectares) for Archaic and 3.1-6.0 acres (1.235-2.448 hectares) for Terminal Woodland. An Initial Woodland modal size of 3.1-6.0 acres is not very meaningful due to the small size of the sample. Historic sites were almost evenly distributed in all classes. In other words, the sample of historic sites did not indicate any site size preference. The relationship between cultural affiliation and site type for the Toronto sites indicated that most Terminal Woodland sites were villages and the remainder were ossuary burials; a finding which is in agreement with the definition of a Terminal Woodland site (Wright, 1966; 1972:67). Archaic sites were either campsites or individual finds of artifacts. This result reinforces the definition of an Archaic site (Wright, 1962; 1973:27-31).

The sites recorded during the 1973 survey of the project area are classified according to size and type in Tables 2 and 3. Most of the sites can be readily assigned to a type. A size estimate, even in a flexible class interval context, however, requires a knowledge of the approximate extent of the site. This demands

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3) The modal statistic is employed for class interval data. The mode is the average class or the class in which the greatest frequency occurs.

Table 2.

THE SIZE OF SITES

SIZE (ACRES)	SIZE (HECTARES)	WITHIN NORTH PICKERING	TOTAL SITES RECORDED
Less than 1	Less than .424	7	9
1.1-3.0	.425-1.234	8	10
3.1-6.0	1.235-2.448	9	11
6.1-10.0	2.449-4.067	1	1
Unknown	Unknown	34	45
		59	76

Table 3.

THE TYPE OF SITES

SITE TYPE	WITHIN NORTH PICKERING	TOTAL SITES RECORDED
Village	21	27
Burial	7	11
Campsite	11	13
Isolated Finds	17	22
Unknown	4	4
	60*	77*

*An Archaic and Terminal Woodland component have been reported for the Sewell Site. This increases the total by one component.

a certain amount of detailed testing and excavation. Consequently, over half of the sites in the sample cannot be classified.

Both the size and type data sets are cross-tabulated with the cultural affiliation data in Tables 4 and 5 respectively. From the size and cultural affiliation cross-tabulation, for both the North Pickering Project and total inventory of sites, the relatively small size of Archaic sites as opposed to larger Terminal Woodland sites is apparent. The Terminal Woodland sites occupy every size class but are concentrated in the 1.1 to 3.0 acre and 3.1 to 6.0 acre classes. These results are in agreement with the findings of the Metropolitan Toronto area survey. Evidence that Archaic sites within the project area occupy a smaller area than Terminal Woodland sites agrees with evidence derived from the excavation of Archaic and Terminal Woodland sites in the Northeast.

The cross-tabulation of type and cultural affiliation data indicates that most Terminal Woodland sites recorded were villages. The Garland ossuary (AlGs-13, Webb, 1969) is an exception. Both the Archaic and the Historic sites are campsites. A number of isolated finds are also affiliated with the Archaic period.

3. The Physical Characteristics of Sites

The physical characteristics of sites were recorded for two basic reasons. First, traditional archaeological survey in Ontario, and recent surveys in the Toronto area, have defined and made use of distinctive physical attributes of archaeological sites and situations in the location of further sites. The results of recent surveys in the Toronto area indicate the association of specific physical characteristics with components of both Archaic and Terminal Woodland periods (Konrad, 1973:58-64). These relationships required further testing and were consequently examined

Table 4.

CULTURAL AFFILIATION AND SIZE OF SITE

TOTAL SITES RECORDED

Cultural Affiliation						
Unknown		4				26
Archaic		1	2			11
Initial Woodland						1
Terminal Woodland		1	8	11	1	7
Historic		3				
Site Size	(acres)	Less than 1	1.1-3.0	3.1-6.0	6.1-10.0	Un-known
	(hectares)	.424	.425-1.234	1.235-2.448	2.449-4.067	

NORTH PICKERING PROJECT

Cultural Affiliation						
Unknown		4				19
Archaic			2			9
Initial Woodland						1
Terminal Woodland		1	6	9	1	5
Historic		2				
Site Size	(acres)	Less than 1	1.1-3.0	3.1-6.0	6.1-10.0	Un-known
	(hectares)	.424	.425-1.234	1.235-2.448	2.449-4.067	

Table 5.

CULTURAL AFFILIATION AND TYPE OF SITE

TOTAL SITES RECORDED

Cultural Affiliation	Village	Burial	Campsite	Isolated find	Unknown
Unknown		9	1	16	4
Archaic			10	5	
Initial Woodland				1	
Terminal Woodland	27	1			
Historic		1	2		

Site Type

NORTH PICKERING PROJECT

Cultural Affiliation	Village	Burial	Campsite	Isolated find	Unknown
Unknown		6	1	12	4
Archaic			8	4	
Initial Woodland				1	
Terminal Woodland	21	1			
Historic			2		

Site Type

for the North Pickering Project sites. Second, the physical attributes of prehistoric sites have been valuable in reconstructing the prehistory of the area.

The physical characteristics of Terminal Woodland village sites and Archaic camp sites are listed in Appendix I. All of the village sites, with the exception of one, which appears to have served a special function, are located within 500 feet (152 metres) of a stream or spring, Archaic camp sites are located up to 1000 feet (305 metres) from streams, springs or rivers. Slope requirements for Archaic sites also vary more than those of Terminal Woodland sites. The latter seem to be associated mostly with gentle and rolling land. Soil texture seems to be the major differentiating physical characteristic. Terminal Woodland agriculturalists in the North Pickering Project area chose sandy loam and loam soils for their village sites while Archaic hunters and gatherers understandably had no clear preference for any soil texture.

Table 6.

THE CONDITION OF SITES

CONDITION	WITHIN NORTH PICKERING	TOTAL SITES RECORDED
Excavated	5	6
Destroyed	15	20
Partially Disturbed	8	12
Partially Destroyed	28	35
Unknown	3	3
	59	76

A Preliminary Prehistorical Sketch for the North Pickering Project

Although Palaeo-Indian hunters may have occupied the North Pickering Site area up to 10,000 years ago, no evidence of any occupation has been uncovered to date. The possibility of their presence in the survey area is suggested by the discovery of a Clovis culture dart head near Markham, Ontario in 1930 (Garrad, 1971:3-18).

Evidence of the earliest occupation of the project area is related to the Laurentian Archaic culture (see Figure 4). The Archaic peoples probably developed out of a Plano Culture base (Wright, 1972:23). Although no evidence of Early Archaic occupation has been identified for the survey area, a number of campsites and isolated finds throughout the area have produced material diagnostic of the Laurentian culture. Two of the projectile points and one of the gouges located in our survey are reproduced in Figure 5. Peoples of this culture occupied the area between 3000 and 5000 years before the present.

> The Laurentian people represented the first substantial population of hunters and fishermen to live in Southern Ontario and the way of life that they established was to have a vital impact upon subsequent events. (Wright, 1972:27).

In the North Pickering site area they chose temporary campsites near reliable sources of water in both the Duffin Creek and Rouge River drainage basins. These sites were never far removed from the major streams where fish could be taken. Although none of the Archaic sites in this area have been excavated, evidence from other sites in the Northeast suggests that Archaic peoples were big game hunters who relied mainly on deer, elk, bear and beaver for food. Smaller game animals, fish, shellfish, birds

Figure 5.

Gouge

Brewerton Corner Notched Point

Genesee Point

Laurentian Archaic Artifacts

Scale: 3/4 natural size.

and wild plant foods were also utilized, apparently on a seasonal basis (Wright, 1972:27). Wright (1972:31) points out that regional variation in the Laurentian Archaic was marked.

Two different varieties of Laurentian Archaic are evident in Southwestern and Eastern Ontario and a blending of these occurs in the Toronto area. This observation is based upon apparent differences in material culture traits (Wright, 1962:141). In addition, each concentration of Laurentian Archaic finds exhibits some differentiating characteristics which are noticeable in tools such as gouges, projectile points, semi-lunar blades and axes. This is probably indicative of differences in the food sources exploited and the total round of activities engaged in from one watershed to another. In the Toronto area, the small rivers, the swamps at the river mouths and the lake may have been exploited for their fish resources. Perhaps the Laurentian peoples of the North Pickering Site area relied heavily on fishing during spawning seasons and on larger game animals during the remainder of the year. This possibility requires examination. Another aspect of this culture that requires elucidation is the nature of their campsites. The discovery of a number of Laurentian Archaic campsites in the survey area is of great value.

Between approximately 3000 and 1000 years ago (1000 B.C.-1000 A.D.) the North Pickering Site area may have remained uninhabited. Only one projectile point of chipped chert attests to any occupation during the Initial Woodland period. This point is diagnostic of a late Archaic and early Initial Woodland or Point Peninsula culture tool making tradition (Figure 6).

Approximately 1000 years ago, prehistoric peoples again moved into the area. These were not hunters and gatherers, but instead incipient agriculturalists who had already made the transition from seasonal movement to semi-sedentary village life. The Pickering peoples who occupied the Miller Site and a few other small village sites adjacent to the southeastern boundary of the North Pickering Site were representative of this group. The

Figure 6.

Scale: approximately twice natural size.

Meadowood Point

Initial Woodland Period - Point Peninsula Culture

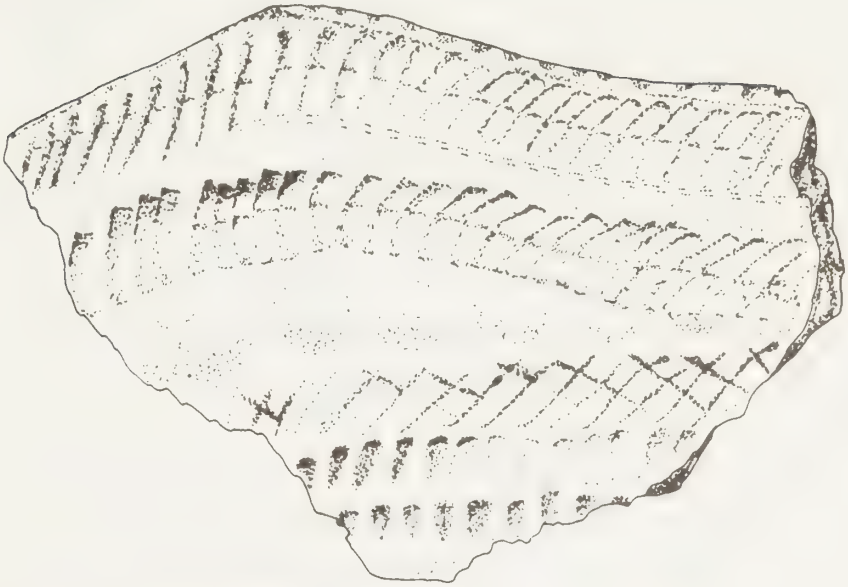
Pickering culture developed out of the Point Peninsula culture in the area north of Lake Ontario (Wright, 1966:22).

Evidence of the Pickering peoples' occupation of the project area is restricted to finds in the southeastern portion. The village sites are located on sandy soils adjacent to springs and small streams. The excavation of the Miller Site has provided evidence of at least six house structures, approximately twenty-five feet wide and up to sixty feet in length, surrounded by a palisade structure (Kenyon, 1968:12-21). Palisade posts ranged between two and one-quarter and nine inches in diameter and were placed about a foot apart to form an oval around the village. The ovate houses were constructed with poles of a slightly smaller diameter. A total of thirty-two individuals were found interred in seven graves within and adjacent to the village (Kenyon, 1968: 23). The artifact analysis indicates that the Pickering people fashioned adzes and other tools by grinding stone; scrapers, drills and projectile points by chipping flint; awls, needles, harpoon points, beads, projectile points and various ornaments by working animal bone; beads and awls by working native copper; and pipes and pottery vessels by employing a knowledge of ceramic manufacture and utilizing local clays (Kenyon, 1968:26-49). A small sample of Pickering culture artifacts from the Miller Site appears in Figure 7. Diagnostic traits are the elbow pipes and the dragstamp motif and bosses on the rims of ceramic vessels.

The Pickering peoples were corn agriculturalists but also relied heavily on hunting and fishing (Wright, 1966:22). Evidence from pit features excavated at the Miller Site indicate that the inhabitants ate fish, and mammals such as beaver (Kenyon, 1968: 25-26). Their fishing activities were likely concentrated on Duffin Creek and may have extended south to Lake Ontario. Hunting was also practised in the area. The corn fields were doubtless located in proximity to the village so that this food source would be readily available to the inhabitants. Cultivation and protection of the crops would also have involved considerably less work if the fields were within easy reach of the village.

Figure 7.

Scale: 1 1/4 natural size.



Rimsherd with Bosses and Linear Dentate Stamping

Elbow Pipe

Bone Harpoon

A Sample of Pickering Culture Artifacts from the Miller Site Collection of the R.O.M. Reproduced with kind permission of Dr. W.A. Kenyon.

The sandy soils surrounding the site were certainly amenable to Pickering agricultural technology. Heavy clay soils would not have been easily cultivated with their agricultural implements. In addition, clay soils do not warm up as early in the spring as do soils of a sandy texture (Hoffman, Wicklund and Richards, 1962:45). Thus, soils of a sandy texture were in part utilized to accommodate the long growing season required by corn.

After the westward expansion of the Pickering peoples and their assimilation of the Glen Meyer peoples in about 1300 A.D., a relatively homogeneous culture existed for about one hundred years throughout Southern Ontario. This time interval is known as the Middle Ontario Iroquois stage (Wright, 1966:54). During the latter part of this stage, which was also known as the Middleport horizon (Wright, 1960), the southwestern portion of the North Pickering Site was occupied by a dense concentration of village sites. Since the inhabitants were shifting cultivators who moved their village sites every ten to twenty years, the numerous (up to fifteen) villages in this concentration were probably all not occupied at the same time. The Middleport horizon was, however, of short duration, and consequently it seems quite plausible that throughout a time period in excess of fifty years, there were a number of simultaneously occupied settlements, shifting location periodically in the Rouge River basin. The excavation of a number of these villages is required to test this hypothesis. Ceramic seriation techniques should be sufficient to date the village occupations. To date only the Millroy Site has seen detailed excavation.

Due to the preliminary nature of any excavations on the Middleport sites in the Toronto area, little can be said about what was probably a concentrated occupation of the southwestern portion of the North Pickering Site between 1350 and 1400 A.D. Although we can infer that the villages were larger than their Early Ontario Iroquois counterparts on the basis of spatial distribution of concentrated artifact finds, no evidence of house structures, palisades, or diet has been determined for this area. Inferences can be made

from the excavations carried out at other Middleport sites in Southern Ontario. The inhabitants of the Rouge River basin villages probably cultivated the sunflower in addition to corn and certainly practised cannibalism. In addition, they adopted an elaborate pipe complex and practised ossuary burial (Wright, 1972:75). Evidence of both the pipe tradition and ossuary burial have been located in the project area. Conical, right-angled pipes with incising on the bowls are common finds. An example of this pipe variety appears in Figure 8. Also illustrated is an Ontario Horizontal rimsherd. This was one of the dominant pottery types of the Middleport horizon (Wright, 1966:61).

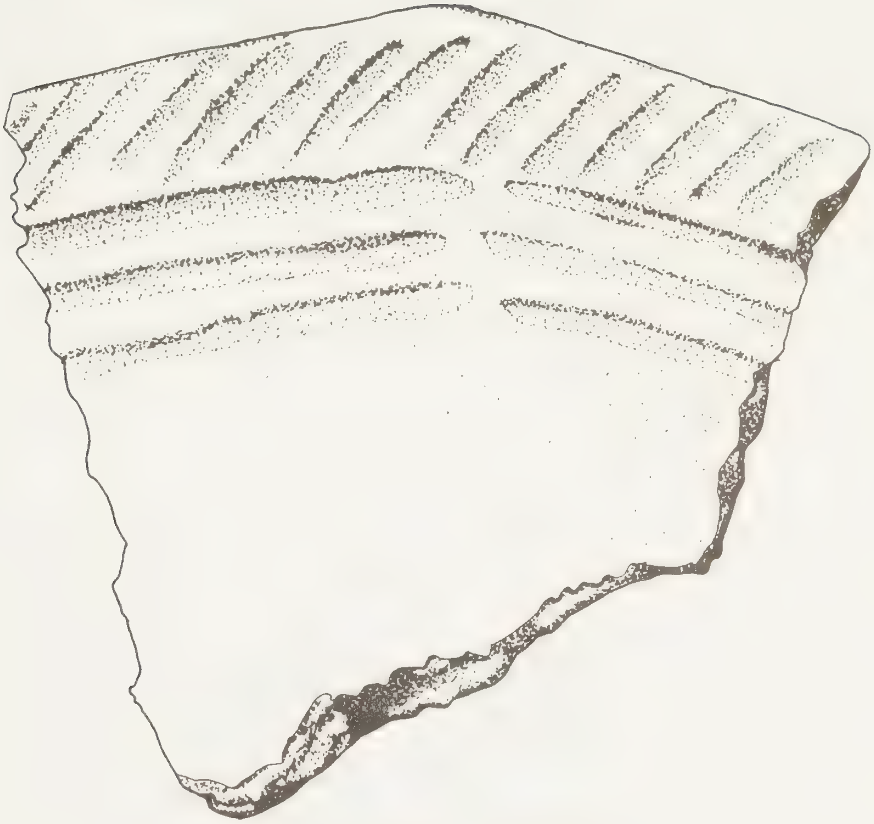
The final prehistoric occupation of the survey area is attributed to the Southern Division, Huron-Petun Branch of the Late Ontario Iroquois (Wright, 1966:66). This is an arbitrary change of nomenclature for these people in the area. There were, however, some differences. By 1400 A.D. beans and squash appear in cultivation and provide the base for an almost wholly vegetarian diet and a resulting increase in population (Wright, 1972:75-78).

Little is known about the Late Ontario Iroquois occupation of the North Pickering Site area. None of the sites have been excavated. The testing of Terminal Woodland village sites in the southwestern section of the survey area indicated the presence of at least three Late Ontario Iroquois sites. The castellation illustrated in Figure 9 is typical of the rim sherds retrieved from these sites. A number of problems remain to be investigated. First, the hypothesis of Middleport to Late Ontario Iroquois development should be examined in this area. In addition, settlement pattern data, dietary information and numerous other kinds of information are required before anything can be said about this final prehistoric occupation of the area.

Occupation of the North Pickering Site by indigenous peoples has also occurred during historic times. Mississauga peoples, Algonkian speakers who moved into Southern Ontario after the demise of the Huron and the abandonment of the north shore of Lake Ontario by the Iroquois, have left evidence of two campsites in the Rouge River

Figure 8.

Scale: 1 1/2 natural size.



Ontario Horizontal Rimsherd

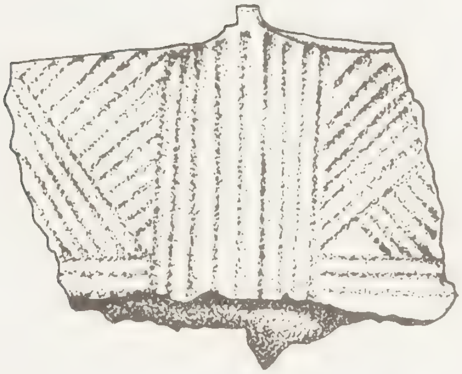
Conical Pipe with Incising on Bowl

Two Middleport Material Culture Traits

valley. These were probably seasonal encampments. Since the occupation of the area by European settlers had already begun when these camps were occupied, the way of life of these Indians would certainly have been altered by European contact.

In summary, the prehistory of the North Pickering Project is highlighted by two intensive occupations, both distinct in period of occupation, settlement patterns, land use, diet, economy and social organization. The cultures related to these occupations are the Laurentian Archaic and the Ontario Iroquois.

Figure 9.



Castellation from a typical Iroquoian Ceramic Vessel

Late Ontario Iroquois

Scale: approximately natural size

Archaeology as a Resource

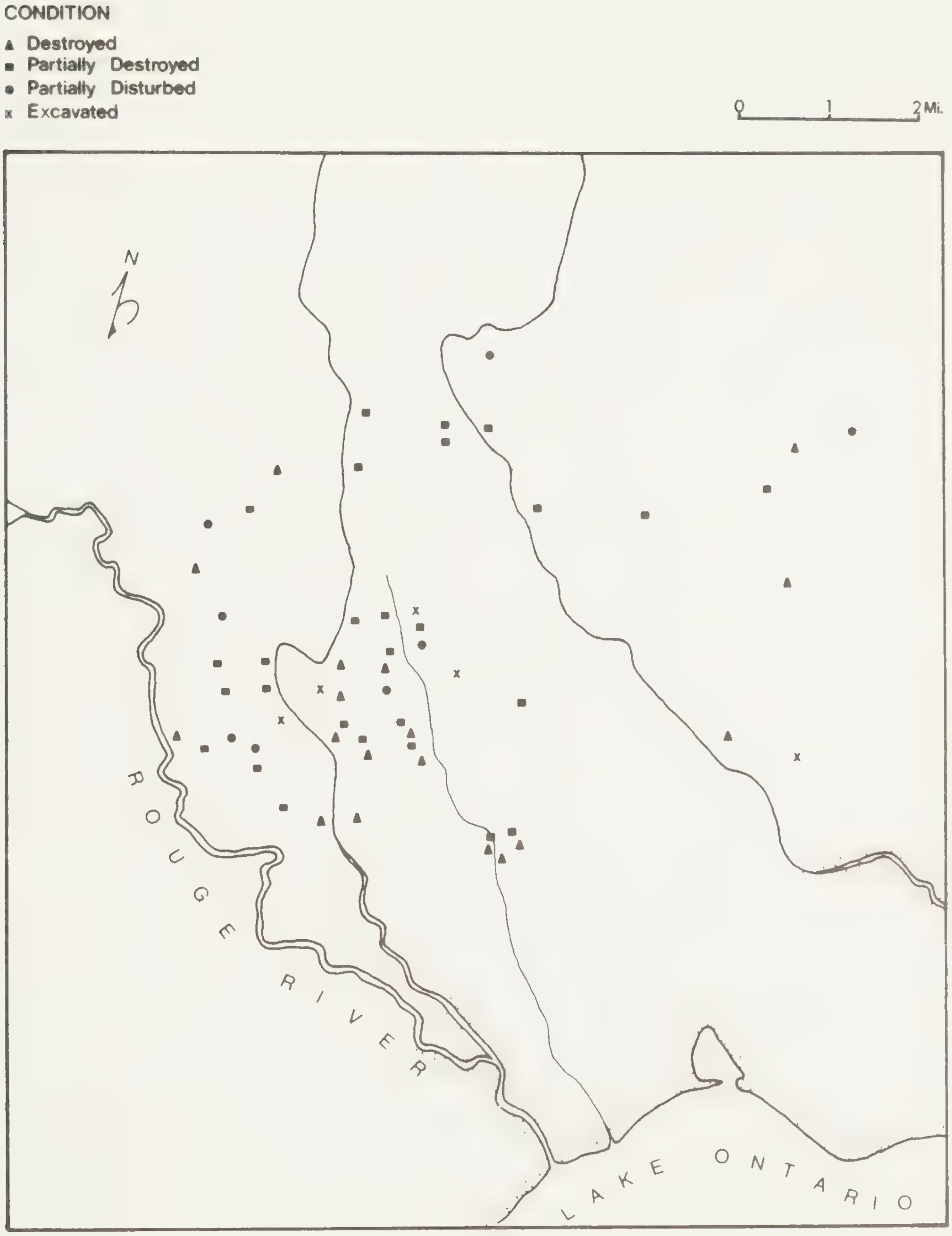
The following discussion outlines the condition of sites in the survey area and employs the condition and cultural affiliation statistics for specific recommendations of preservation, salvage and further sampling.

1. The Condition of Sites

The data on site condition are presented in Appendix II and are also summarized in Table 6. Of the fifty-nine sites recorded for the North Pickering Project, only five have seen excavation to date. The results of the Miller and Millroy excavations alone have been published. The Miller Site excavation is by far the most extensive of these archaeological investigations. Fifteen of the remaining sites have been destroyed, twenty-eight have been partially destroyed and eight have been partially disturbed.

The areal distribution of sites by condition class indicates that the best preserved sites occur mainly in the southwestern quarter of the North Pickering Site (Figure 10). This is understandable. The site concentration is greatest in this quarter but the march of development is not as apparent as elsewhere in the townsite. Land use is related almost entirely to agricultural activities.

Figure 10.



The Condition of Archaeological Sites in the North Pickering Project Area

2. Some Prospects for the Archaeological Resources of the North Pickering Project

The development of a new community can provide a unique opportunity for interpreting and preserving the past within the context of a plan for the future. The most meaningful and definitive aspects of the past can be preserved as a heritage for the future whereas, in the normal, haphazard march of progress and development, the legacy of the past, in its material and non-material manifestations, is very often distorted beyond recognition, even to the point of total obliteration. A number of alternatives are open to the developers of the North Pickering Project. At one end of the spectrum is the alternative of total amputation of the cultural past. A community can be developed with total disregard for the area's prehistory and history. The landscape can be completely transformed to approximate a concept for the future. But the future is rooted in the present, just as the present is rooted in the past, and complete transformation is highly unlikely if not impossible. The other end of the spectrum would see the maintenance of the present and also the development of a new community for thousands of people. The probable result lies somewhere between these two extremes. However, it remains to be seen whether the North Pickering Project will lean towards token representation of the past, as manifested by the odd museum, historical site, and so on, or whether it will integrate history and prehistory into a future development, meaningfully maintaining the legacy of past landscapes and cultural experiences to insure the depth of heritage necessary for cultural continuity.

3. Recommendations for the Preservation, Salvage and Utilization of Sites

In order to provide lists of sites that should be preserved for further research or salvaged in the face of imminent destruction; or of sites requiring further sampling due to their condition so that they might be utilized for reconstruction and interpretation, the condition data were cross-tabulated with the cultural affiliation and the site type data. The cross-tabulation of the cultural affiliation and condition statistics indicates that a substantial number of both Archaic and Terminal Woodland sites are either partially destroyed or partially disturbed (Table 7). Attention must be focused on these sites. Although four Terminal Woodland sites have seen excavation, Archaic sites have not been investigated. The excavation of at least two Archaic components is required. The cultural affiliation and site type cross-tabulation results underscore the need for the investigation of Archaic campsites (Table 8). Burial sites within the North Pickering Project area, with one exception, have all either been destroyed or excavated. Only the Pennock Site I (AlGt-55) requires further investigation.

The lists of sites noted in Appendix III requiring preservation, or salvage and additional sampling, and the list of sites that could be suited to reconstruction and interpretation, were formulated on the basis of the foregoing cross-tabulations and our accumulated knowledge of the sites themselves.

Figures 11, 12 and 13 provide a visual indication of the three classes of site condition. Destroyed sites are almost or totally eradicated. An example of this is the prehistoric component that was removed by gravel pit operations (Figure 11). Agricultural activity can destroy information and artifacts near the surface (Figure 12), while the uninterrupted maintenance of woodlot vegetation can preserve portions of sites from total distur-

Table 7.

CONDITION AND CULTURAL AFFILIATION

TOTAL SITES RECORDED

Cultural Affiliation Condition	Excavated	Destroyed	Partially disturbed	Partially destroyed	Unknown
Unknown	1	12	2	15	
Archaic		1	4	10	
Initial Woodland				1	
Terminal Woodland	5	5	6	9	3
Historic		2	1		

NORTH PICKERING

Cultural Affiliation Condition	Excavated	Destroyed	Partially disturbed	Partially destroyed	Unknown
Unknown	1	9	1	12	
Archaic		1	3	8	
Initial Woodland				1	
Terminal Woodland	4	3	5	7	3
Historic		2			

Table 8.

CONDITION AND TYPE OF SITE

TOTAL SITES RECORDED

Site Type

Condition	Excavated	Destroyed	Partially disturbed	Partially destroyed	Unknown
Village	4	5	6	9	3
Burial	2	7	2		
Campsite		2	3	7	
Isolated find		2	1	19	
Unknown		4			

NORTH PICKERING

Site Type

Condition	Excavated	Destroyed	Partially disturbed	Partially destroyed	Unknown
Village	3	3	5	7	3
Burial	2	4	1		
Campsite		2	2	6	
Isolated find		2		15	
Unknown		4			

Figure 11. A destroyed site.

Figure 12. A partially destroyed site.

Figure 13. A partially disturbed site.

bance (Figure 13). The number of partially destroyed and disturbed sites in the survey area is substantial. This is due mainly to the fact that the North Pickering Site remains, for the most part, an area of agricultural land use. As has been indicated in the assessment of the condition of sites in the Toronto area (Konrad, 1973:68-72), urban development is the largest single factor in the destruction of prehistoric resources. This can be avoided in the North Pickering Project.

Appendix I

The Physical Characteristics of Terminal Woodland Village Sites

SITE	DRAINAGE	TYPE OF NEAREST WATER SOURCE	DISTANCE TO NEAREST WATER SOURCE Feet and (Metres)	SLOPE	SOIL TEXTURE
AlGt-4	Well drained	Stream, Spring	501-1000 (152.6-304.9)	Rolling	Loam
AlGt-7	Well drained	Stream	Less than 50 (15.3)	Gentle	Loam
AlGt-8	Imperfect	River	Less than 50 (15.3)	Rolling	Loam
AlGt-9	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Loam
AlGt-12	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Loam
AlGt-14	Well drained	Spring	51-500 (15.4-152.5)	Rolling	Loam
AlGt-19	Well drained	Stream	51-500 (15.4-152.5)	Gentle	Loam
AlGt-28	Well drained	River	51-500 (15.4-152.5)	Mod. Steep	Loam
AlGt-30	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Sandy Loam
AlGt-31	Well drained	Spring	51-500 (15.4-152.5)	Gentle	Loam
AlGt-35	Well drained	Stream	501-1000 (152.6-304.9)	Rolling	Loam
AlGt-36	Well drained	Stream	51-500 (15.4-152.5)	Gentle	Loam
AlGt-41	Well drained	Stream	51-500 (15.4-152.5)	Mod. Steep	Loam
AlGt-60	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Loam
AlGt-63	Well drained	River	51-500 (15.4-152.5)	Gentle	Sandy Loam
AlGs-1	Well drained	Stream	51-500 (15.4-152.5)	Gentle	Sandy Loam
AlGs-5	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Loam
AlGs-6	Well drained	Stream	51-500 (15.4-152.5)	Steep	Loam
AlGs-14	Well drained	Spring	51-500 (15.4-152.5)	Gentle	Sandy Loam
AlGs-15	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Loam
AlGs-18	Well drained	Spring	51-500 (15.4-152.5)	Rolling	Loam
AlGt-62	Well drained	River	51-500 (15.4-152.5)	Rolling	Loam

SITES	DRAINAGE	TYPE OF NEAREST WATER SOURCE	DISTANCE TO NEAREST WATER SOURCE Feet and (Metres)	SLOPE	SOIL TEXTURE
AlGs-10	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Sandy Loam
AlGs-11	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Sandy Loam
AlGs-23	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Loam
AlGt-17	Well drained	River	51-500 (15.4-152.5)	Rolling	Loam
AlGt-18	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Loam

The Physical Characteristics of Archaic Camp Sites

SITE	DRAINAGE	TYPE OF NEAREST WATER SOURCE	DISTANCE TO NEAREST WATER SOURCE Feet and (Metres)	SLOPE	SOIL TEXTURE
AlGt-13	Well drained	Stream	51-500 (15.4-152.5)	Gentle	Loam
AlGt-29	Well drained	Spring	51-500 (15.4-152.5)	Rolling	Clay Loam
AlGt-38	Well drained	River	51-500 (15.4-152.5)	Mod. Steep	Loam
AlGt-43	Well drained	Spring	501-1000 (152.6-304.9)	Rolling	Loam
AlGs-17	Well drained	Stream	501-1000 (152.6-304.9)	Gentle	Loam
AlGs-22	Well drained	River	501-1000 (152.6-304.9)	Steep	Clay Loam
AlGs-27	Well drained	Stream	51-500 (15.4-152.5)	Rolling	Clay Loam
AlGt-64	Well drained	Spring	51-500 (15.4-152.5)	Gentle	Sandy Loam
AlGs-3	Well drained	Stream	51-500 (15.4-152.5)	Gentle	Sandy Loam

Appendix II

Archaeological Site Data for the North Pickering Project and Adjacent Area

A. DATA CODE *

1. TYPE OF SITE

Village	1
Burial	2
Campsite	3
Isolated Find	4
Unknown	5

2. SIZE OF SITES acres and (hectares)

Less than 1 (.424)	1
1.1 - 3.0 (.425-1.234)	2
3.1 - 6.0 (1.235-2.448)	3
6.1 - 10.0 (2.449-4.067)	4
Unknown	5

3. DRAINAGE

Poorly Drained	1
Imperfectly Drained	2
Well Drained	3

4. TYPE OF NEAREST WATER SOURCE

Spring	1
Stream/Creek	2
River	3
Lake	4

5. DISTANCE TO NEAREST WATER SOURCE

feet and (metres)

0 - 50 (0-15.3)	1
51 - 500 (15.4-152.5)	2
501 - 1000 (152.6-304.9)	3
1001 - 5000 (305.0-1524.1)	4
5001 + (1524.2 +)	5

6. SLOPE

Level	1
Gentle	2
Rolling	3
Moderately Steep	4
Steep	5

7. SOIL TEXTURE

Sand	1
Sandy Loam	2
Loam	3
Clay Loam	4
Clay	5
Muck	6

8. CONDITION

Destroyed	1
Partially Destroyed	2
Partially Disturbed	3
Excavated	4

9. CULTURAL AFFILIATION

Period	
Archaic	1
Initial Woodland	2
Terminal Woodland	3
Historic	4
Unknown	5

Culture or Stage	
Laurentian	1
Early Ontario Iroquois - Pickering	2
Middle Ontario Iroquois	3
Late Ontario Iroquois	4
Historic Iroquois	5
Mississauga	6
Unknown	7

* Site location data is on file with the Historical Sites Branch, Ministry of Natural Resources, Queen's Park, Toronto, Ontario.

B. SITE DATA FOR THE NORTH PICKERING PROJECT

SITE	TYPE	SIZE	DRAINAGE	WATER SOURCE	DISTANCE TO WATER SOURCE	SLOPE	SOIL TEXTURE	CONDITION	CULTURAL AFFILIATION	
AlGt-4	1	2	3	1	3	3	3	4	3	3
AlGt-5	2	5	3	2	2	2	3	4	5	7
AlGt-7	1	5	3	2	1	2	3	1	3	7
AlGt-8	1	2	2	3	1	3	3	4	3	3
AlGt-9	1	3	3	2	2	3	3	3	1	1
AlGt-9	1	3	3	2	2	3	3	3	3	7
AlGt-12	1	2	3	2	2	3	3	2	3	4
AlGt-13	3	5	3	2	2	2	3	2	1	1
AlGt-14	1	3	3	1	2	3	3	2	3	3
AlGt-15	2	5	3	2	2	3	3	1	5	7
AlGt-19	1	2	3	2	2	2	3	2	3	7
AlGt-28	1	3	3	4	2	4	3	2	3	7
AlGt-29	3	2	3	1	2	3	4	2	1	1
AlGt-30	1	3	3	2	2	3	2	3	3	4
AlGt-31	1	5	3	1	2	2	3	2	3	7
AlGt-34	4	5	3	2	2	2	3	2	5	7
AlGt-35	1	3	3	2	3	3	3	3	3	4

B. SITE DATA FOR THE NORTH PICKERING PROJECT (cont'd)

SITE	TYPE	SIZE	DRAINAGE	WATER SOURCE	DISTANCE TO WATER SOURCE	SLOPE	SOIL TEXTURE	CONDITION	CULTURAL AFFILIATION	
AlGt-36	1	3	3	2	2	2	3	3	3	3
AlGt-37	4	5	3	2	2	2	3	2	5	7
AlGt-38	3	5	3	3	2	4	3	2	1	1
AlGt-39	4	5	3	3	3	2	3	2	1	1
AlGt-40	4	5	3	2	3	4	3	1	1	1
AlGt-41	1	5	3	2	2	4	3	1	3	7
AlGt-42	4	5	3	2	2	3	3	2	5	7
AlGt-43	3	5	3	1	3	3	3	3	1	1
AlGt-44	5	5	3	2	2	3	3	1	5	7
AlGt-45	4	5	3	2	2	4	3	2	2	7
AlGt-46	3	1	3	3	2	4	3	1	4	6
AlGt-47	4	5	3	2	2	3	3	2	5	7
AlGt-48	3	1	3	2	2	3	3	2	5	7
AlGt-49	5	5	2	1	3	3	3	1	5	7
AlGt-50	3	1	3	3	3	1	3	1	4	6
AlGt-51	4	5	3	2	3	3	3	2	5	7
AlGt-52	4	5	1	2	4	3	3	2	5	7
AlGt-53	4	5	3	3	4	2	3	2	5	7
AlGt-54	4	1	3	2	3	2	3	1	5	7
AlGt-55	2	1	3	3	3	3	2	3	5	7
AlGt-56	4	5	4	4	4	3	4	3	5	7
AlGt-57	4	5	3	3	2	3	3	2	1	1
AlGt-58	5	5	3	2	2	3	3	1	5	7
AlGt-59	4	5	3	2	2	3	3	2	5	7
AlGt-60	1	4	3	2	2	3	3	3	3	7
AlGt-63	1	5	3	3	2	3	2	1	3	7
AlGs-1	1	2	3	2	2	2	2	4	3	3
AlGs-5	1	2	3	2	2	3	3	1	3	7
AlGs-6	1	3	3	2	2	5	3	1	3	7
AlGs-13	2	1	3	2	3	3	3	4	3	7
AlGs-14	1	2	3	1	2	2	2	1	3	7
AlGs-15	1	3	3	2	2	3	3	2	3	7

AlGs-17	3	5	3	2	3	2	3	2	1	1
AlGs-18	1	5	3	1	2	3	3	2	3	7
AlGs-19	2	1	3	2	2	3	2	1	5	7
AlGs-20	4	5	2	2	2	3	3	2	1	1
AlGs-21	4	5	3	2	2	3	3	2	5	7
AlGs-22	3	5	3	3	3	5	4	2	1	1
AlGs-24	2	5	3	2	2	3	3	1	5	7
AlGs-25	4	5	3	2	2	3	3	2	5	7
AlGs-26	2	5	3	2	2	3	2	1	5	7
AlGs-27	3	2	3	2	2	3	4	3	1	1
AlGs-28	5	5	3	2	2	2	2	1	5	7

C. SITE DATA FOR THE ADJACENT AREA

SITE	TYPE	SIZE	DRAINAGE	WATER SOURCE	DISTANCE TO WATER SOURCE	SLOPE	SOIL TEXTURE	CONDITION	CULTURAL AFFILIATION	
AlGt-61	4	5	3	2	3	2	3	2	5	7
AlGt-62	1	2	3	3	2	3	3	2	3	7
AlGt-64	3	5	3	2	2	2	2	2	1	1
AlGs-3	3	1	3	2	2	2	2	3	1	1
AlGs-10	1	3	3	2	2	3	2	4	3	2
AlGs-11	1	5	2	2	2	3	2	1	3	2
AlGs-23	1	3	3	2	2	3	3	1	3	7
AlGs-29	2	5	3	2	3	3	2	1	5	7
AlGs-30	2	5	3	2	2	3	2	1	5	7
AlGs-31	4	5	3	2	2	3	3	2	5	7
AlGs-32	4	5	3	2	2	3	3	3	5	7
AlGs-33	4	5	3	2	2	3	3	2	1	1
AlGs-34	4	5	3	2	2	3	3	2	5	7
AkGs-5	2	1	3	3	2	4	1	3	4	5
AkGt-17	1	2	3	3	2	3	3	3	3	7
AkGt-18	1	5	3	2	2	3	3	2	3	7

Appendix III

Archaeological Sites that Require Further Investigation

AlGt-12	Sim Reesor Site I
AlGt-13	Ken Reesor Site I
AlGt-14	Ken Reesor Site II
AlGt-28	Park Site
AlGt-38	Sim Reesor Site II
AlGt-39	Reading Site
AlGt-43	Bielby Site
AlGt-57	Unwin Site
AlGs-22	Sime Site
AlGt-41	W. Reesor Site
AlGt-42	V. Taylor Site
AlGt-63	D. Reesor Site
AlGs-17	Armstrong Site
AlGs-18	Shea Site

Archaeological Sites Suitable for Prehistoric Reconstruction and Interpretation

AlGt-9	Sewell Site
AlGt-35	Burkholder Site II
AlGt-29	Ansell Site
AlGt-30	Fred Beare Site
AlGt-36	New Site
AlGt-60	Hamlin Site
AlGs-27	Salgo Site

Archaeological Sites that Must Be Preserved or Salvaged

AlGt-8	Woodland Park Site
AlGt-9	Sewell Site
AlGt-19	Burkholder Site I
AlGt-29	Ansell Site
AlGt-30	Fred Beare Site
AlGt-35	Burkholder Site II
AlGt-36	New Site
AlGt-55	Pennock Site I
AlGt-60	Hamlin Site
AlGt-64	Smitham Site
AlGs-3	A. Bunker Site
AlGs-27	Salgo Site
AkGs-5	Stable Burial Site
AkGt-17	Archie Little Site II

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PART II

The Draper Site: White Pine Succession on an Abandoned Late Prehistoric Iroquoian Maize Field

Irene Bowman

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Introduction

The area in which the Draper Site is located has changed considerably in the five hundred years that have passed since it was inhabited by late prehistoric Iroquoians. Most of this change has, understandably, taken place since the early 1800's when lumber companies and settlers first became established. If we are to attempt to reconstruct the environment in which these people existed, archaeological data and present biological surveys will have to be supplemented with information from the diaries of early missionaries, surveyors and settlers who recorded something of its original state.

The most detailed descriptions of vegetation patterns for this area are to be found in the records of early surveyors who were required to make notes on the soil, timber and water resources within each lot. Where complete records have been preserved, as in Markham Township, it has been possible to reconstruct the maple-beech climax forest almost exactly as it was before European settlers left their imprint. In Pickering, detailed records exist only for the southeastern quarter of the township.* The Draper Site is in the northwestern quarter. The only information on vegetation in this part of the township which appears to have survived is found in a document concerning white pine masting reserved for the Royal Navy which indicates the past existence of a vast, even-aged pine stand situated immediately to the west of the Draper Site. Smaller stands were located in other areas of the township.

In areas where natural or human disturbances have taken place the processes of succession can result in distinctive vegeta-

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* Additional research might uncover more information on pre-settlement vegetation in other areas of Pickering Township.

tion patterns. The late prehistoric Iroquoian agriculturalists would most certainly have disturbed their environment in clearing and burning enough land to produce maize, the most important item in their diet. As has previously been indicated, the late eighteenth century report on pine masting has indeed demonstrated the occurrence of a striking vegetation pattern in the immediate vicinity of the site. The possibility that the large, even-aged pine stand adjacent to the Draper Site represents a stage in the recolonization of the abandoned maize fields of the late prehistoric Iroquoians will be examined.

Physiography and Climate

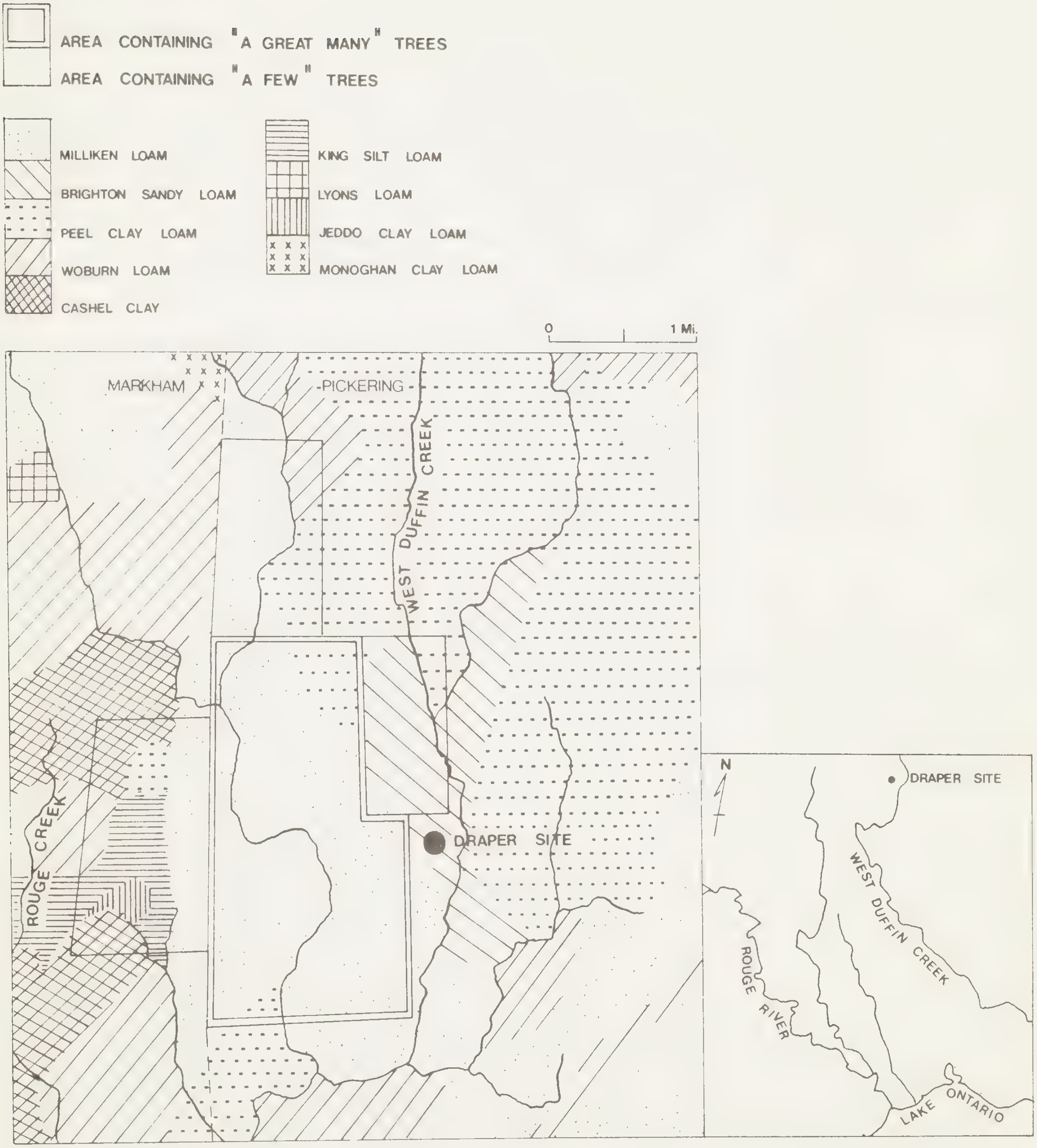
The habitation area of the Draper Site is located on a tract of relatively infertile sandy loam overlying calcareous parent material at the top of a stream valley incised by West Duffin Creek. These soils are part of the Brighton series and are developed from coarse textured outwash sands and gravels which are low in organic matter (Olding, Wicklund and Richards, 1950: 36-38). To the east and northeast, on the opposite side of the creek, are the very fertile clay loam soils of the Peel series which are developed from lacustrine deposits overlying a clay till. To the west and northwest are the fertile, loamy, imperfectly drained limestone and sandstone derived tills of the Milliken series (Olding, Wicklund and Richards, 1950: 34). All of the above series are in the Grey-Brown Podzolic Great Soil Group, and all have a neutral surface reaction. This is important since "podzols tend to be slightly too acidic especially in the upper horizons" for growing maize (Heidenreich, 1970: 268).

Of the three soil series, Milliken loam and Peel clay loam are at present rated as good for the growing of ensilage corn. Brighton sandy loams are rated as fair. Thus, two large areas of fertile soils suitable for maize growing existed in close proximity to the Draper Site. The soils of the Milliken series would have been lighter and more easily worked with respect to late prehistoric Iroquoian technology than would the heavier clay loams of the Peel series. Brighton sandy loams, while rating as only fair cropland, would also have been light and easy to cultivate. Soils of the Brighton and Milliken series share the advantage of warming earlier in the spring than soils having a high clay content. This is important since maize "is one of the few annual crops that uses the full frost-free period 135 days in the South Slopes region to complete its life cycle ..." (Brown, McKay and Chapman, 1968: 29). Finally, to ensure accessibility to these two soil groups, which

were the most suitable for maize agriculture, the village was located on the same side of the creek. Evidence from soil data would, therefore, seem to point to the area of Milliken loams as being most favourable in all respects for late prehistoric Iroquoian agriculture. Not only were these soils fertile, but they would also have been easy to cultivate and easily accessible to the village inhabitants who worked in the fields (Figure 1).

The importance of a long growing season for maize has already been discussed with respect to the capacities of different soil types for warming in the spring. The growing season of Southern Ontario as a whole is at present favourable for the growth of corn which is one of the major field crops. In those areas where climate is moderated by proximity to the Great Lakes, the autumn growing season is extended. The climate of Southern Ontario, and therefore the length of the growing season, is probably much the same today as it was at the time of occupation of the Draper Site, five hundred years ago. In fact, the present climate is probably more like the climate of five hundred years ago than that of the period which intervened. Ladurie (1971: 225) noted that in other areas of the world "a multisecular phase of glacial expansion ... was in full force from 1590 and did not end, in the Alps, until after 1850." This climatic deterioration is known as the "Little Ice Age" and may have had some influence on the climate of Southern Ontario. Thus, the climate as well as the soils of the area in which the Draper Site is situated was favourable for the cultivation of maize.

Figure 1.



SOIL MAP OF DRAPER SITE VICINITY SHOWING LOCATION OF PINE STAND

Problems in Reconstructing Vegetation

The flora and fauna of the North Pickering area, in which the Draper Site is situated, have changed considerably in the one hundred and eighty years following European settlement.* The lumber industry, which was responsible for most of the initial changes, began its operations in the early 1800's with the cutting of white pine masting for the Royal Navy. It was followed by the square timber trade and later by sawmilling which catered to the needs of settlers. After 1880, the total yearly output of pine lumber in Ontario County began to decline rapidly - an indication that the large stands were disappearing (R.D.H.P., 1956: III:6). The destruction of the forest by the lumber industry was completed by the settlers, who in clearing their land left only an occasional woodlot as a reminder of what had once been.

It is obvious from the above that in attempting to reconstruct vegetation on the basis of historical accounts, only those records which date from pre-logging and pre-settlement times will be of use. If inferences about still earlier time periods (i.e., the period during which the site was occupied) are to be drawn from this material, it must be remembered that climatic change and the activities of the inhabitants of the village themselves would have influenced the vegetation trends of the centuries which followed. Thus, the forests described by surveyors in the 1790's would not necessarily have been identical to the forests existing at the time the Draper Site was occupied.

More specific information on vegetation existing at the time of

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* See Appendices I and II.

village occupation can be ascertained from fossil pollen analysis. Unfortunately, the sandy soils (Brighton sandy loams) of the Draper Site are unsuitable for such studies because of the very poor conditions for preservation of pollen grains. However, the results of studies performed on the varved sediments of Lake Ontario and Crawford Lake by Dr. J.H. McAndrews and M. Boyko are pertinent to this discussion. Fossil maize pollen, which is not common in lake sediments, is present in Crawford Lake sediments for the interval 1290-1610 A.D. with the greatest concentration occurring from 1370-1480 A.D. (Boyko, 1973: 12). The presence of maize is thought to represent Indian agriculture in the vicinity of the lake over a period of three centuries. Cultivation of maize implies that " ... forest clearance and tree percentages do drop a little during the Indian period (Dr. McAndrews)" (Boyko, 1973: 12). Pollen cores taken from Lake Ontario have shown that " ... the age of the pine rise is 300 to 400 B.P." (McAndrews, 1971: 226), and a re-examination of Crawford Lake data has pushed this date back to 500 B.P. (McAndrews, personal communication). These dates coincide roughly with the period of climatic deterioration and also with the approximate time period during which the stand of white pine adjacent to the Draper Site colonized; (although the date of 500 B.P. given for the invasion of pine around Crawford Lake precedes the onset of glacial expansion in the Alps by about one hundred years). Thus, an increase in pine pollen follows the disappearance of maize in the Crawford Lake sediments.

It seems unlikely that white pine, which is normally found scattered " ... throughout a large part of its geographical range ... not in pure stands but in varying admixtures with hemlock and hardwoods", would have been able to colonize on a large scale without some catastrophe having first removed the maple-beech climax forest which today predominates in undisturbed areas in the vicinity of the site, and which probably was predominant at the time of late prehistoric Iroquoian occupation (Nichols, 1935: 410). Studies by Lutz (1930) on an even-aged eastern white pine

forest in Pennsylvania, and Huberman (1935) on western white pine succession in northern Idaho, have borne out the conclusion that in these areas white pine is able to colonize on a large scale only in the early stages of succession. Once the forest canopy has closed over, the young pine growth " ... is unable to endure the conditions ... and dies out after reaching a height of less than one foot ... " (Lutz, 1930: 16).

The fossil pollen record for Crawford Lake and Lake Ontario indicates that three centuries of maize growing during the "Indian period" were followed by a rise in pine. In deciding which agency was responsible for this rise, it seems obvious that the clearing of land for agriculture created open areas which, once abandoned, were colonized by pine. If we attempt to explain this phenomenon through other agencies such as climatic change, problems arise. Presumably any climatic change drastic enough to have destroyed large areas of the maple-beech forest would also have destroyed the white pine. A drier climate would have favoured the growth of pine, but would not have been sufficiently radical to have allowed widespread invasion. Although pollen analysis has not been possible for the Draper Site, historical accounts of large pine stands may allow us to make similar inferences about late prehistoric Iroquoian agriculture. It is in this area of investigation that the early descriptions have proved useful in determining the location of the pine.

Accounts of Missionaries and Surveyors

François de Salignac-Fénelon, a Sulpician missionary, was one of the first white men to record his impressions of the vegetation of the Lake Ontario region. In a memoir attributed to him dated 1670 he noted that " ... the lands which surround her [Lake Ontario] and which are not covered with prairie, are covered with very beautiful and very large trees, but those which one finds the most of are pine and oak" (Yon, 1970: 152).

It is unfortunate that he was not more specific. Nevertheless, surveyors' descriptions of a century later in Pickering and Markham Townships (and elsewhere) have indicated the location of pine stands occurring within the maple-beech forest. Perhaps the large numbers of pine trees which Fenelon observed were in truth stands such as these.*

The descriptions by early surveyors of the forests of Pickering and Markham Townships have permitted a partial reconstruction of the area before logging and settlement. The records of Abraham Iredall (1794) and another unknown surveyor (1801) indicate that the original forest of Markham Township was dominated by maple and beech on good land with associated species of basswood, elm, ash, hemlock and some pine. In low, sometimes swampy, areas cedar and ash were found. Gibson, surveying in Markham in 1827, mentions black ash, basswood and some hickory on low ground that is wet in spring and fall (R.D.H.P., 1956: III, 1).

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* Fénelon's purpose in writing his *Mémoire* was to paint a picture of Canada that would encourage French involvement. In listing the "advantages" to be found, he may have exaggerated to achieve this end. "All kinds of good woods" would have been advantageous for "the sea industry ... construction and (for the development of) ... a useful trading business ... " (Yon, 1970: 182).

The surviving records for the southeastern quarter of Pickering Township are very detailed and the particular associations of tree species occurring on certain types of soil have been noted. The report and field notes of Augustus Jones (1791) of the First Concession and Broken Front, and the field notes of William Hambly (1793) from a survey of Major Smith's Land in the southeast corner of Pickering, have been very useful in distinguishing some of these associations which included the following: maple, beech, black oak, basswood, elm and birch on deep, rich soil; oak, pine and maple on loose, good soil; pine and hemlock on loose, sandy soil; hemlock on stoney soil; cedar on low, swampy ground; spruce and tamarack on low, swampy ground; and ash on low wet ground.

The Historical Evidence for Pine Stands Occurring in Pickering Township

Perhaps the most interesting information on the pre-logging and pre-settlement vegetation of Pickering Township is found in a document entitled *Report of Mastings and other Timber fit for the Use of the Royal Navy, In the Township of Pickering*, signed by Augustus Jones, Deputy Surveyor, on the sixth of December, 1797. This report describes the girth at breast height, apparent height and relative abundance of pine on a lot by lot basis. Although the species of pine is not stated, it is evident that the trees were eastern white pine (Pinus strobus L.). White pine is the only eastern conifer attaining the heights described by Jones. It was also favoured for masting timber because of the long clean shafts of trees grown in closed stands. By plotting out the areas heavily timbered with pine on a county map showing lots and concessions, it has been possible to determine the exact location of these great stands of pine (Figure 2).

In preparing this paper I have made the assumption that all large white pine trees in Pickering Township were reserved for the Crown,

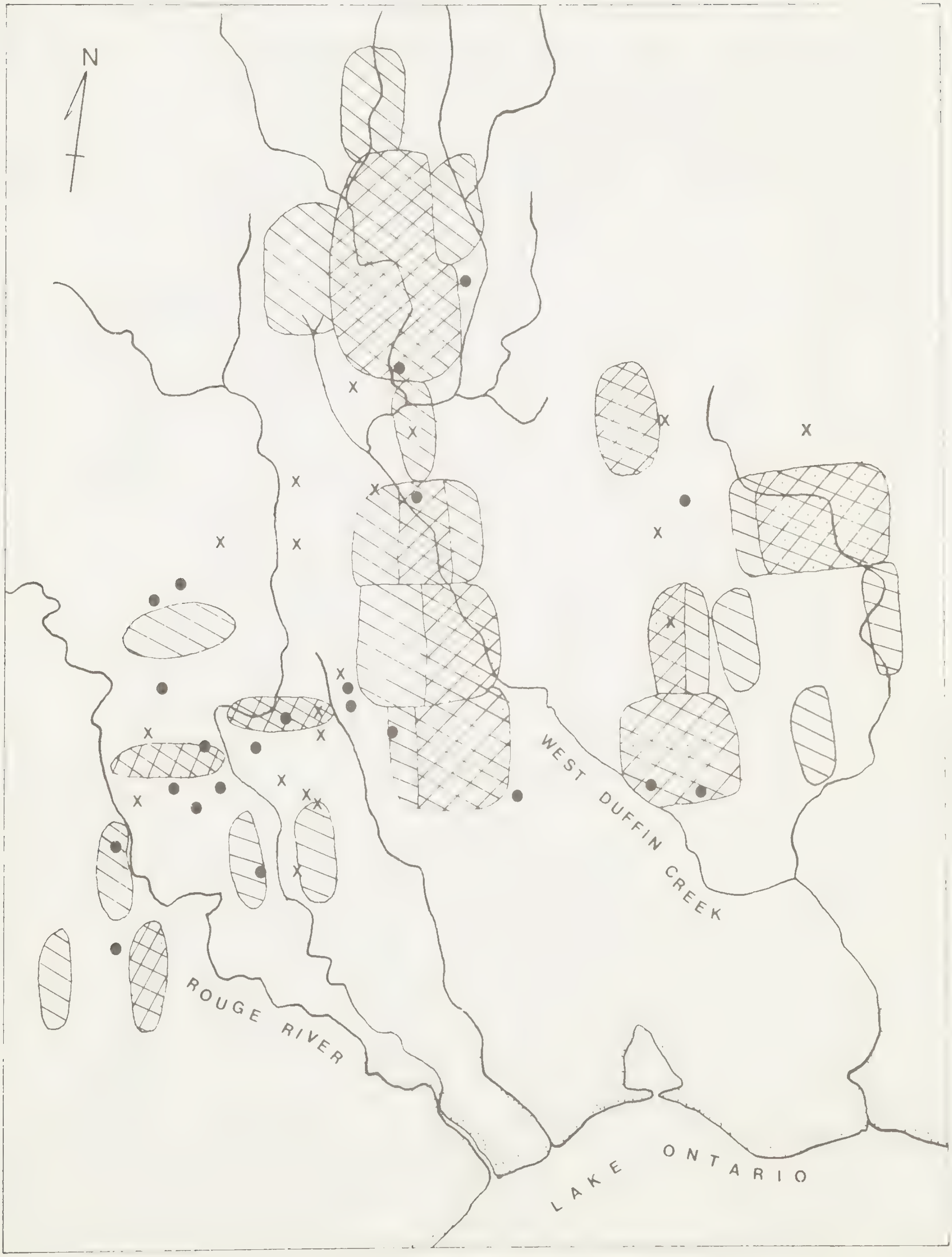
Figure 2.

▦ AREA CONTAINING "A GREAT MANY" TREES

▧ AREA CONTAINING "A FEW" TREES

CULTURAL AFFILIATION OF SITES

● LATE PREHISTORIC IROQUOIAN X UNKNOWN



LOCATION OF PINE STANDS IN RELATION TO ARCHAEOLOGICAL SITES

and were therefore recorded in Jones' *Report*. I have based this assumption on information from several sources which indicates the concern shown by the British Government over the protection of its masting timber. In a letter dated October 8, 1795, Acting Surveyor Feneral D.W. Smith instructed Abraham Iredall that:

> ...certain Individuals have an intent of subverting the Bounty of Government in the Grants of the Waste Lands of the Crown, which have been solely and expressly intended for the purposes of Husbandry, and ...employ themselves in the Lumber Trade ... and thereby Commit considerable waste of the White Pine, which is generally reserved (Maps and Survey Records, Letters Written No. 4: 1052-54).

In New England, where exploitation of the white pine had begun in the early 1600's, the Crown attempted to discourage settlers from cutting and wasting (or selling) these enormous trees. In a strongly worded decree dated 1761 the royal governor was instructed to insure the inclusion in all future land grants of a clause that would:

> reserve all white or other Sort of Pine Trees fit for Masts, of the growth of 24 Inches Diameter and upwards at 12 inches from the Earth, to Us our Heirs and Successors, for the Masting of our Royal Navy, and that no such Trees shall be cut - without our licence - on Penalty of the Forfeiture of such Grant, and of the Land so granted reverting to the Crown; and all other Pains and Penalties as are or shall be enjoined or inflicted by any Act or Acts of Parliament passed in the Kingdom of Great Britain (Peattie, 1948: 52).

Augustus Jones unknowingly left us a means of estimating the age of the Pickering stands when he recorded the heights of the trees. Although his height estimates were probably not totally accurate when describing the apparent heights of trees on different lots and concessions, he was sufficiently thorough as to distinguish between trees 140, 150 or 160 feet tall (or higher). The age of the stand immediately to the west and northwest of the Draper Site is of particular interest. The site itself occupies parts of lots 29 and 30, concession VII in Pickering Township. Jones recorded that the area immediately to the west of the site, lots 31 through 35, concession

VII, contained "a great many" trees having an apparent height of 140 feet (43 metres). In addition, to the northwest of the site, lots 32 through 35 of concession VIII were covered with "a great many trees" having apparent heights ranging from 140 to 160 feet 43 to 49 metres). "A few trees" of this description were recorded on lots 30 and 31 of concession VIII, and lots 33 and 34 of concession IX. Another surveyor, whose name remains unknown, working in Markham Township on the nineteenth of July, 1801, recorded a few pine growing on lots 21 through 26 of concession X. These lots abut against the timbered lots in concessions VII and VIII, Pickering Township. The heights of these trees were not recorded. The total acreage represented consists of about 1,800 acres (730 hectares) containing "a great many" trees and about 2,000 acres (810 hectares) containing "a few trees".

It is clear from these records that the central portion of the stand was heavily timbered while its perimeters, except in the vicinity of the site, were sparsely timbered with pine. Beyond the perimeters of the stand, forest growth dominated by maple and beech was described in Markham. No records for Pickering appear to have survived for the rear concessions, but it is clear from descriptions of adjacent Markham Township that the maple-beech forest was unbroken.

The trees of this stand and others in the vicinity were removed without any attempt to determine their age. Yet if we compare their heights with the heights of pines from stands for which age estimates have been made, we can assign them an approximate age. Spalding, in 1899, compiled a Table of the Measurements of white pine grown under similar conditions, grouped in age classes for averaging. One group of trees studied by him in Michigan from "a two-roof grove, [with an] upper roof formed of White Pine, [and an] under roof of Beech, Maple, Fir, and occasionally White Birch and Hemlock ... " had attained an average height of 141 feet (43 metres) when growing on brown, loamy, moderately loose sand (Spalding, 1899: 92). These trees were found to have an average age of 258 years. If we assign an approximate age of 250 years to

the stand of 140 foot trees discovered to the west of the Draper Site in 1797, it follows that the stand began its growth in approximately 1550. Some of the trees to the northwest of the site had attained heights of 160 feet, according to Jones. Again, records from a late nineteenth century white pine stand in Michigan indicate an average age of 446 years for a "moderately dense grove of White Pine intermixed with hardwoods and Hemlock, with occasional Norway Pine, [growing on] brown loamy sand, medium fine grain[ed] ... loose, very deep, [and] well drained ... " (Spalding, 1899: 92). The average height of the white pine in this stand was 157 feet (47.9 metres). Perhaps the taller (160 foot) trees to the northwest of the Draper Site were older than the 140 foot trees to the west of the site. If Jones' height estimates were correct and if the ages of these trees are comparable to the ages of trees of the same height from nineteenth century Michigan pine stands, the 160 foot trees may have begun their growth as early as 1350.

It is also possible that differences in the composition of the forest understory contributed to height differences in the Pickering stands.

> The height development of White Pine seems to progress more rapidly when it grows mixed with other species [such as Norway pine].
>
> ...
>
> [This effect depends] ... upon the capacity of the associated species to grow in height as well as upon the time when the associated species are either introduced among the pine or received by it under their shelter (Spalding, 1899: 32).

Since Jones left no record of the associated tree species found in the stands, it is impossible to come to any definite conclusion on this matter. It seems unlikely, however, that this factor alone would have resulted in a height difference of 20 feet between the 140 and the 160 foot trees.

It is true that locality influences the height growth of white pine through variation in climate, soil and shade features. Spalding was able to measure differences in the height growth of trees from

Pennsylvania, Maine, Wisconsin and Michigan resulting from environmental influences. The Pennsylvania trees " ... started at a lower rate than those in all other localities, but after the twentieth to the twenty-fifth year they surpass[ed] all others." (Spalding, 1899: 33). This was attributed to early growth of the trees in mixture with hemlock. The retarded growth of Maine and Wisconsin trees (compared with Michigan trees) between the eightieth and ninetieth year was attributed to poor soil and the effect of winds respectively. However, the trees grown in Michigan " ... with its tempered lake climate, present ... a most regular and persistent height curve, coming nearest to the average of all locations." (Spalding, 1899: 33). The age estimates for the Pickering pine stands have been based upon height comparisons with nineteenth century Michigan trees for which age determinations were made. The available evidence suggests the validity of such a comparison on the basis of similar climate and soil features. Both the Pickering and Michigan pine stands were within the sphere of influence of the Great Lakes where white pine makes its best growth. The soils which supported the Michigan trees were described as brown, loamy, loose sands, while the Pickering trees were found on Milliken loam which has a " ... fine crumb structure ..." (Olding, Wicklund and Richards, 1950: 35). While the lack of detailed evidence in Jones' *Report* makes error inevitable in this type of comparison, the general growth curve followed by white pine makes it unlikely that this will be serious enough to affect the arguments presented here.

Significance of the Pine Stands

Large, even-aged stands of white pine are not a normal element of the maple-beech climax vegetation of southern Ontario. It has already been established that young pine are not able to colonize on a large scale under the heavy canopy which exists in this type of climax forest. The prerequisite for a large, even-aged stand in an area where white pine normally plays only a minor role, therefore, would appear to be fire, or some other major disturbance likely to have exposed a large area of land surface for colonization. Studies of large, even-aged stands of *Pinus strobus* L. by Lutz (1930) and of *Pinus monticola* Dougl. by Huberman (1935) have revealed evidence of fires from examinations of fire scars on the annual rings of the trees themselves. Also from information found in the accounts of seventeenth and eighteenth century travellers and early settlers of fires set by the Indians "to facilitate hunting ... to encourage new growth of grass" or to cause certain species of plants used for food to "renew themselves and yield further crops" (Lutz, 1930: 18). Cooper (1961: 150) also states that the American Indians "often ... burned intentionally - to drive game in hunting, as an offensive or defensive measure in warfare, or merely to keep the forest open to travel."

In addition to eastern and western white pine, other species of conifers whose seedlings have high light requirements are able to colonize burnt-over areas. Douglas firs, for example, are found in pure, even-aged stands only where forest fires have "arrest[ed] the succession by creating openings in the forest into which the light, winged seeds of Douglas firs can fly from adjacent stands." As the old fir trees die, shade tolerant cedars and hemlocks come in to fill the gaps and in this way the climax vegetation of the region is restored (Cooper, 1961: 151).

Historical records of the area to the west and northwest of the Draper Site at the time of its colonization by pine are nonexistent, and the pine trees themselves have long since disappeared. It is only possible to speculate on the type of disturbance which might have resulted in large scale colonization by pine. It seems reasonable that this large, even-aged pine stand might represent an early stage of succession occurring on the abandoned maize fields of the late prehistoric Iroquoian agriculturalists who inhabited the adjacent village. This hypothesis is supported by the fact that the time period during which the pine growth to the west of the site began (c.1550) coincides roughly with the time of abandonment of the village in the late fifteenth or early sixteenth century. Jones' records also indicated that taller, and possibly older trees* were found growing to the northwest of the site along with trees of the same height (140 feet) as those to the west of the Draper Site. It is impossible to tell whether these trees, which had attained heights of 160 feet, were intermixed with the shorter trees, or whether, as seems more likely, they represented a separate, older stand. If this is the case, an older maize field and perhaps another site might have existed to the northwest of the Draper Site. Another possibility is that the Draper Site experienced an earlier occupation (Donald MacLeod, personal communication).

Additional support for this hypothesis comes from soil data. The greatest concentration of pine trees occurred in exactly that area to the west and northwest of the site which is characterized by Milliken loams (Figure 1). These soils, as described previously, are good for the growing of ensilage corn, and because of their loose texture would have been more suited to late prehistoric Iroquoian agricultural techniques than would the heavy clay loams of the Peel series. White pine also makes its best growth on fertile, loamy soils such as those found in the Milliken series, but

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* See page 14 for detailed description.

the occurrence of a large stand is somewhat unusual since "the more tolerant species, particularly hardwoods, generally crowd out the pines on richer soils" (Bedell and Horton, 1960: 50). The above information increases the likelihood that large scale colonization by pine in this location came about as a result of the abandonment of maize fields by the inhabitants of the nearby village.

Another interesting feature regarding the pine stand adjacent to the Draper Site is the area of land that it occupied. The stand stretched approximately one and one-half miles (two and a half kilometres) to the west of the site and about two miles (three and a quarter kilometres) to the northwest. Heidenreich (1970), in his calculations of the size of the maize fields of the largest villages of Huronia - Cahiague, Ossossane and Teanaustaye - has surmised "that the Hurons did not wish to cultivate fields that were more than about one and one-half miles from their village" (Heidenreich, 1970: 323). He reasons that by that time the nearest fields would have become exhausted, and the protection of workers in the far fields would also have become a problem (Heidenreich, 1970: 323). Thus, the area represented by the pine stand corresponds closely with Heidenreich's estimate of the maximum size of field practical for agriculture. However, despite general agreement on the large size of the Draper Site (6 to 10 acres / 2.4 to 4.0 hectares) it will not be possible to estimate village maize requirements until further excavations of longhouses allow some kind of population estimate to be made. It is interesting to note here that the White Site, which to date has yielded no evidence of any kind of structures, lies within the boundaries of the area once occupied by the pine stand on parts of lot 33, concession VII. Perhaps it was used as a maize husking station by women and children working in the fields.

The above information takes on even more meaning in view of the existence of other large, even-aged pine stands in Pickering Township to the south and southwest of the Draper Site. These stands, some of which appear to have been older (c. 1300-1350 and 1450

according to height estimates) than the stand adjacent to the Draper Site, were located in an area dotted with other late prehistoric village sites. The correspondence between the location of some of the pine stands and some of the village sites is indeed worthy of note (Figure 2).

Perhaps when the cultural affiliations of sites discovered in the vicinity during the summer of 1973 (Konrad and Ross, Part 1: Research Report No. 4) are better known, the location and ages of these pine stands might be useful in rounding out our picture of agricultural activity in the area. The possibility also exists that some of these areas were exposed by natural or Indian generated forest fires, but this cannot be determined without further studies.

Summary

The data which have been presented to support the hypothesis that the pine stand to the west and northwest of the Draper Site represents the area once covered by late prehistoric Iroquoian maize fields may be summarized as follows:

1) Large, even-aged stands of white pine are not a normal element of the maple-beech climax vegetation of the region.

2) The even-aged character of the trees (250 years) as determined by height estimates made in 1797 indicates that the stand began its growth around 1550. This is the approximate time period following site abandonment in the late fifteenth or early sixteenth century during which large scale colonization by pine could have taken place.

3) The abandoned maize fields of the late prehistoric Iroquoians would have satisfied the light requirements of white pine seedlings which otherwise die out quickly under the canopy of a maple-beech climax forest.

4) Fossil pollen analysis on the sediments of Lake Ontario and Crawford Lake indicates a pine rise dating from 300 to 400 years before the present.

5) The soils which supported the greatest numbers of pine are at present rated as good for the growing of ensilage corn. These loose, loamy soils would have been amenable to late prehistoric Iroquoian agricultural techniques, unlike the heavy clay soils to the east and northeast of the site.

6) The area of land occupied by the pine stand corresponds roughly with Heidenreich's estimates of agricultural land requirements for some of the larger villages in Huronia.

Appendix I

Early Settlement of the Site Locality

The specific location of the Draper Site is on parts of lots 29 and 30, concession VIII, Pickering Township. These two lots were first settled in 1799 by Mary Ann Fleming and passed through several ownerships until the 1840's when lot 29 was settled by Adam Spears, a native of Scotland. He "established a sawmill on the stream running through the farm. Large quantities of lumber were teamed from here to be shipped at Frenchman's Bay" (Wood, 1911: 295). Later, in 1859, lots 30 and 31 of the same concession were settled by William H. Burk, who came from Markham to Pickering. He too built a sawmill on West Duffin Creek (Wood, 1911:228). It is evident that the site locality experienced many changes in the first fifty years following settlement alone.

Appendix II

Effects of Environmental Deterioration on Native Fauna

Large scale land clearing operations inevitably affect other aspects of the environment. Logging removes the natural habitats of mammals and birds, thereby reducing their numbers. In addition, the removal of timber affects stream life by increasing erosion and by lowering the water table through increased evaporation from exposed land surfaces. In 1911, William R. Wood commented that

" ... with the deforestation of the country the streams have dwindled, and lake salmon come to Whitevale [on West Duffin Creek] tables only by way of the canning factory." In the 1800's the same species had been recorded "as far as the fifth concession ... in Pickering Township ... " during the spawning season (Wood, 1911: 202-203).

Erosion has undesirable consequences for stream life in areas where a marginal strip of streamside vegetation has not been left to prevent overland runoff from increasing sedimentation within the stream. In the case of Duffin Creek, once known for its spectacular salmon runs which earned it the French name of Rivière au Saumon,* increased sedimentation from logging and clearing operations may have been one of the factors resulting in the disappearance of the lake salmon. Heavy silting buries fish eggs and reduces the amount of oxygen available to the developing embryos, thus causing increased mortality. It reduces the number of food organisms and also the occurrence of habitats required by both trout and salmon for spawning (James, 1956: 43; Burns, 1970: 7-8).

In addition to man's activities, natural agencies (the destructive capacities of which can be heightened by human modification of the environment) have also acted in changing the character of the streams of the area. After Hurricane Hazel, October 1954, sections of the Rouge River and Highland Creek and parts of Duffin Creek "which were [formerly] listed as silted or slow-flowing may now be riffles and rapids; other sections which were rapids are now turned into pools ... Bank erosion was very greatly accelerated" (R.D.H.P., 1956: V, 17).

Thus, the native fauna of the forests and streams in the vicinity of the Draper Site have been as much obscured by lumbering, settle-

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* This name appears on a map drawn by Pierre Boucher de la Iroquerie in 1757 (R.D.H.P., 1956: I, 11). The earlier, Indian name of - Sin qua trik di qui ock - meaning Pine wood along side - is cited by Augustus Jones in a document entitled *Names of Places*, dated July 4, 1790.

ment and natural events as have the forests themselves. Once again, it is necessary to look to historical records for information.

Historical Accounts of Fishing

Perhaps the most interesting description of fishing on Duffin Creek and surrounding area comes from the Journal of Wing Rogers.

> And when but a youth and up to manhood, and the early part of my days, we cought hundreds and thousands of Salmon in Duffinses Creek, that ran through my fathers farm on the which we built a sawmill and grist mill, and also they were cought in all the cricks and streams on the north side of Lake Ontario that was large enough. But as the fishermen increased, and the country became cleared up, and mildams built, which prevented them from growing up to spawn, besides all that nets and seins, and the increase of navigation, on those waters (where 60 or 80 years before there was not a white man to be sean) - doubtless this is the reason why they faled; and also all kinds that had to spawn in the running waters the salmon trout whitefish sturgeon herin pike and pickerell - and many more kinds live in the great water, the mullets and suckers the beautiful little speckle trout Eels run up the Creeks and also, men contrive schemes and plans even to draw them out of deep waters, and the poor fish, like the Natives of Aboregines, are fast diminishing, for which I sorrowe (McKay, 1961: 183-195).

La Rochefoucault-Liancourt, in an earlier description of fishing dating from 1795, mentions " ... the vast quantities of fish with which the lakes abound, and especially of sturgeons in Lake Ontario ... " (Fraser, 1916: 31-32). In an account of a fishing expedition in the vicinity of the Niagara River and Lake, he recounts that:

> Upwards of five hundred fish were caught, among which were about twenty-eight or thirty sturgeons, small pikes, whitings, rock-fish, sun-fish, herrings, a sort of carp ... salmon, trouts; in short, all the fish was of a tolerable size. Middle sized fish are easily caught by anglers on the banks of both the river and the lake; they frequently catch more than their families can consume in several days (Fraser, 1916: 49).

Historical Accounts of Game

In 1911, William Wood noted that "In the earliest quarter of the nineteenth century wolves were to be met with and on into the middle years bears were often seen" (Wood, 1911: 202). In 1882 an anonymous writer for *Picturesque Canada* described a portage route that had once led up from the Whitby shore "through a famous deer park ... [and on to] the bass fishing on Lakes Scugog and Simcoe ...*" (*Picturesque Canada*, ed. G.M. Grant, 1882: Vol.II, 624). Earlier still, in 1687, Count Denonville gave the following description of a feast given for him at Ganatsekwyagon, a Seneca village on the north shore of Lake Ontario at Frenchman's Bay, after his flotilla returned from burning the Iroquois villages of unbelievers on the south shore of the lake.

> ... we ... arrived at a place Ganatsekwyagon ... We found them with two hundred deer they had killed, a good share of which they gave to our army, that thus profited by this fortunate chase (Robinson, 1956: 56).

Finally, Fénelon, in his *Mémoire* of 1670, left us with the following description of the lands around the St. Lawrence River in the vicinity of the Kenté Mission on the Bay of Quinte.

> The river is very abundant in fish and the lands which surround her farther on are very fertile, and they are still all covered in moose, stags, deer, bear, beavers etc. (Yon. 1970: 152).

The above descriptions indicate that plentiful game was available at the time of European contact. However, attempts to draw inferences about the distribution of fauna at the time of site occupation encounter the same problems as those involved in reconstructing vegetation patterns. The clearing of forest for agri-

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* Another Indian path "probably led northwards up Duffin's Creek" (R.D.H.P., 1956: I, 54).

culture by the late prehistoric Iroquoians would have destroyed the habitats and reduced the numbers of many species. The abundance of these species would presumably have increased after agricultural activity in the area ceased, and after forest succession created new habitats. Deer, on the other hand, would have benefitted from land clearing, which in creating new areas for pasture would have contributed to an increase in the population of this species. The re-establishment of the climax forest on land once used for agriculture would have reduced their numbers. Thus, depending on the type of forest cover at the time of contact, early European accounts of wildlife may or may not be representative of the faunal composition of the general area during the period of its occupation by late prehistoric Iroquoians. Fortunately, preserved faunal material from the sites themselves provides a more complete record of the animal species used for game.

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